

A.N.A.L.O.G. 400/800

ATARI NEWSLETTER AND LOTS OF GAMES

MAGAZINE



JANUARY/FEBRUARY 1981

Become a STAR COMMANDER
Five Star Treks • What's New for 81
Music Composer • Maze Rider

PREMIERE ISSUE

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EDITORIAL

ATARI NEWSLETTER AND LOTS OF GAMES!

By Lee Pappas

Newsletter and magazine? Yes. ANALOG is really a magazine, however to get this acronym to work we needed a word for the letter 'N'. I have heard all types of responses to the name of our publication — usually a slight snicker. But what's in a name anyway, and our name is something most ATARI owners will come to respect, I hope. With this first issue, a gap has been filled in the world of ATARI computing. While the 400 and 800 have been available for over a year now, we have noticed no 'core' or central information service to help those who need it, outside of scattered user groups and frequent calls to ATARI. What we hope to accomplish will bring you more enjoyment out of your ATARI system.

The question right now is how technical should ANALOG be? The questionnaire is vital for the answer; please fill it out and at the same time, take a chance to win a 16K memory module or new game. Copies of the results will be sent to ATARI and other ATARI computer related companies, to give them an idea where the median of ATARI owners lie. Judging from many letters received so far, many of you need more help than the BASIC Reference manual and other publications have so far supplied.

The ATARI computers are fast becoming recognized as more than a games machine. The computing power of the 400/800 extends far beyond 'Star Raiders' and through this magazine we'll show you just how far. The ATARI is also the 'hot' computer of the eighties: at the Consumer Electronics Show in Las Vegas this January — three questions frequently asked at the information booth were "where's the best restaurant, which way to the rest rooms, and where's the ATARI booth?" Sales in late December picked up so well, parts of the country were on an allocation program — ATARI fell behind with the increased demand for the computers, certainly a good sign!

Included in this magazine is a column (hopefully a regular one), 'LISTEN', which is aimed specifically for owners of the Music Composer cartridge. 'Printout From ATARI...' will provide you with the latest news direct from ATARI. Other publications may print the news first — but none will be as accurate as ANALOG. We will print no information that isn't confirmed by ATARI or other marketer. Many of the 400/800 owners also own the ATARI Video Computer System, so we will also have a regular column on the VCS and new cartridges for use in it.

NOT REALLY "LOTS OF GAMES"

One opinion ANALOG will try to change, is the idea of many, that the ATARI is just an advanced

computer game. The color TRS-80 is a joke in comparison to even the 400. The APPLE II is archaic in technology next to the 800, and any other micro on the market just can't match the ATARI's built-in computing power. Many computer stores won't carry the 400 or 800... "there just isn't any software available," well we receive software and new products at an almost daily basis at the ANALOG office, so much that we have a difficult time reviewing it all. I am very impressed with the amount of really good software available in just a year's time. The 'In The Spotlight' column will highlight the companies which we feel provide good software at above average service. ATARI will not be included in this, but reviews on their products will be included — and we won't be afraid to voice any doubt, on products they produce, that we feel we are not up to ATARI's own standard of quality.

Feedback from you is something we look forward to. I feel most ATARI owners would like to hear what other users around the country are doing, and comments are certainly welcome concerning ANALOG. We encourage you to contribute to this magazine; many of you have mentioned this in your letters already. The only regrets we at ANALOG have, is that we ourselves wish we received ANALOG rather than print it, so we too could look forward to being surprised when the next issue arrived! □

A BRIEF HISTORY OF ATARI

In 1972, Nolan Bushnell founded the ATARI company in his garage. While trying to discover what a television could be used for, when not being viewed for network programming, Mr. Bushnell created PONG, the first video/arcade game. ATARI has since become the largest video/entertainment company in the home and arcade markets.

The ATARI company, in 1976, was sold to Warner Communications for 28 million dollars. Now a complex exceeding 14 buildings, ATARI's headquarters and production facilities are located in Sunnyvale, California. (about 20 minutes south of San Francisco).

The name ATARI comes from a term used in an ancient Chinese game. "Atari" was used as a warning when a player was about to capture one or more of his opponents pieces. "Atari" was allied to another term in the game: "katsuro". So just imagine, you might have been the owner of a KATSURO game system, or a KATSURO 400/800 computer. □

ATARI NEWS.....

NEW SOFTWARE FOR FIRST HALF OF 1981

Two new games and a Nuclear Reactor Simulation face the ATARI owner! The big news is the release of **ASTEROIDS** and **MISSILE COMMAND** in the form of ROM cartridges for both the 800 & 400.

ASTEROIDS has many more features than the arcade version including multi-color and superior sounds. Both this and **MISSILE COMMAND** use the joysticks. One to four players are pitted against a myriad of flying space boulders and a flying saucer that occasionally hums by to try and zap you. You can play singly, or team up; even an "every man for himself" option.

MISSILE COMMAND is a dazzling version of the exciting arcade game of the same name. One or two players must launch their missiles to protect six cities against the attacking forces of incoming nuclear missiles, bombers, killer satellites, and "smart bombs". The better you do, the faster the incoming fire. You have limited missiles, and when you reach ten thousand points you recover a lost city. The game ends when all cities are destroyed.

SCRAM duplicates the function of a nuclear power plant. The player must produce as much energy as possible before having a melt down, or shutting the reactor down (**SCRAM**). An entire plant is shown on the screen and the player must "find and fix problems as they develop". This cassette is also an excellent educational tool to get the functions of a nuclear plant across to the student by getting him actively involved in a simulation. Available on cassette for \$19.95.

These programs for release first half of 1981. □



ATARI ASTEROIDS



ATARI MISSILE COMMAND



ATARI SCRAM



ATARI PILOT

ATARI PERSONAL INTEREST SOFTWARE FOR 1981 — FIRST HALF

A new language introduced for the 800 & 400: **PILOT. PILOT** (Programmed Inquiry, Learning or Teaching) is an educational language that is very easy to learn. This cartridge uses the graphics and sound capabilities of the 800 & 400 through simple commands. More information can be found in the "Computer Language" article, this issue.

The Personal Fitness cassette asks the user a series of questions to provide the computer with the information to provide a custom exercise program. "The computer then displays an exercise figure and even counts out the routine." Includes two cassettes and lists for \$24.95.

Five cassettes comprise Conversational Spanish, the first in ATARI's foreign language library; a manual is also included. Using the television "words and phrases are carefully pronounced and spelled out on the screen." French, Italian, and German courses are to follow, later this year. Five cassettes and workbook which lists for \$59.95. □



New Products Release
Sunnyvale, California
January 5, 1981

Ziping along in the home video entertainment field, ATARI unveiled the latest innovation — an advanced and more remote control version of its Video Computer System.

Sleek, futuristic styling combines with up to date technology making video games more convenient and enjoyable than ever before. Two remote controllers eliminate the cumbersome wires allowing the user to play the game without interference, and any where in the room he chooses. You can play, reset, and select the game without using the console controls — the transmitting handheld controllers provide for this. The joystick/paddle combination controls act as quick as though they were physically attached to the console.

An LED lighted control panel provides light touch to activate a certain function, and a hinged dust cover on the console back provides convenient storage for the remote controllers when not in use, with more room underneath for TV cable and power supply storage.

Ports on the side allow the use of standard controls (wired) and all the VCS game programs can be used on the system. □

REVIEW: ATARI Space Invaders
Robert Hartman
ANALOG Technical Staff

Space Invaders, one of the most popular arcade games, is now available for the ATARI Computers. As in the tradition of the game, Space Invaders is fast and exciting. This machine language program displays 10 colors in a mode similar to Graphics 7 in ATARI Basic.

It is however different from the arcade version. The ATARI game has no barriers to protect you from laser bombs — this may be to your advantage or lead to an early death depending on your point of view and skill in the game. A large spaceship descends slowly on your left as you pick off each group of bizarre looking aliens, from this ship they emerge.

Though no great surprises become apparent during the game, there is one occurrence that is interesting. It happens when you are fairly well through the game (around 1000 points), and when this happens the first time you may be a bit startled. It will get you thinking — "why did the guy who wrote this program do this?" But Space Invaders is a great program and game. The Apple II Space Invaders runs 20K+ while the ATARI version runs 8K with color! This game should most definitely be part of everyone's software collection. □



New Products Release
Sunnyvale, California
January 5, 1981

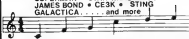
After years of research and development, ATARI is able to bring the fascinating 'magic' of holography to electronic games. The COSMOS Programmable Game System featuring Holoptics(tm), combines 3-D holoptic images and advanced LED game playing, with the most sophisticated and realistic sound effects available in an electronic game.

Two microprocessors account for the sound and exciting LED playfield. The system uses cartridges, which are inserted into the slot, positioning the holoptic image over the LED array. The player sees a green 3-D image over red game figures (cars, missiles, gunfighters) lit up by the LED's.

At critical moments during the game the 3-D image changes to indicate an outcome or other aspect. The game can be played player vs. computer, or player vs. player. The game is AC powered and 8 cartridges will be available: Superman, Football, Basketball, Outlaw, Sea Battle, Space Invaders, Road Runner, and included with the game — Asteroids.

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FOR USE WITH ATARI MUSIC COMPOSER

ANALOG 400/800
PO BOX 23
WORCESTER, MA 01603

NEW PRODUCTS....

Mosaic Electronics
Box 748

Oregon City, OR 97045

"The MOSAIC 32K Ram Board can be used on both the ATARI 400 and 800." Used on a 400 you can use disk storage, and on an 800, the system will run cooler reducing any chance of computer 'lock-up'. The board can be user installed in the 400 and just inserted in the 800's connectors behind the ROM 10K board. To be available February, 1981.

Automated Simulations

1988 Leghorn Street

Mountain View, CA 94049

Soon to be available from Automated Simulations are Adventure type games to run on the ATARI computers. These games are very heavy into graphics and the ATARI versions will utilize this with great detail. The first game to be marketed, "The Datestones of Ryn", will be cassette based, probably requiring 24K to operate. Price to be announced.

ANALOG 400/800 Magazine

P.O. Box 23

Worcester, MA 01603

The first in a series of data cassettes to be used with the ATARI Music Composer cartridge will be ready for shipment in March, 1981. Containing themes from popular films, including many science fiction opening scores. Films include Close Encounters, Star Wars, Battlestar Galactica, Live & Let Die, and The Empire Strikes Back.

ANALOG 400/800 Magazine

P.O. Box 23

Worcester, MA 01603

An advanced Adventure program will be available in March requiring a 40K RAM system and 810 disk drive. No graphics are involved, however the game will use up to 60K of disk files providing the player with many hours (or weeks) of playing time. The game may be saved on disk for continuation at a later date.

Electronic Specialists

171 S. Main Street

Natick, MA 01760

ELECTRONIC SPECIALISTS' recently announced SUPER ISOLATOR is designed to control electrical pollution. Incorporating heavy duty spike/surge suppression, the SUPER ISOLATOR features 3 individually dual-Pi filtered AC sockets. Equipment interactions are eliminated and disruptive/damaging power line pollution is controlled. The SUPER ISOLATOR will control pollution for an 1875 watt load. Each socket can handle a 1000 watt load. Severe AC Power Line pollution can be controlled with the MODEL ISO-3 SUPER ISOLATOR for \$85.95.

"TRIANGLE" Graphics Demo

Note: hit any key to stop

```

5 C=1
10 GRAPHICS 23
15 E=INT(300*AND(1))
20 D=INT(300*AND(1))
25 C=1
30 COLOR C
35 B=39
40 A=79
45 FOR S=1 TO D STEP E
50 FOR X=A TO B STEP -2
55 PLOT 80,A-X
60 DRAWTO 80+X,INT(A/S)
65 DRAWTO 80,X
70 DRAWTO 80-X,INT(A/S)
75 DRAWTO 80,A-X
80 IF PEEK(764)<255 THEN END
85 COLOR C
90 NEXT X
95 C=C+1
100 NEXT S
105 SETCOLOR 0,T,2
110 T=T+1
115 GOTO 5
  
```

Parlez~vous Pascal?

COMPUTER LANGUAGES

By Charles Bachand

Picture if you will two doctors huddled together in a corner of a hospital cafeteria talking shop. As you approach these two learned men and try to listen in on their conversation, you will no doubt become confused and bewildered by the terminology used. Items such as scalpels, hemostats, and respirators will probably have little meaning to you. These terms are foreign to you. It is as if you had just arrived in another country. The same is true of computer languages. Computer languages are different because they perform different functions, different jobs.

Meanwhile, back at the hospital, a dentist joins our two colleagues in the cafeteria. He is much more at home in this setting than we will ever be, but he is not completely accepted as an equal. The dentist would like nothing better than to talk about cavities and molars and the cleaning of teeth, whereas our two friends are busy discussing heart transplants and kidney operations and Mrs. Smith in room 31A who has a terminal case of bad breath. We see that the dentist is left out of the conversation. Not because he isn't a doctor, but because he wants to talk about dentistry, a different dialect of the language of medicine.

The analogy could have been made using carpenters and plumbers, cowboys and indians, or even Laurel and Hardy. But the points to stress are that there are many different languages and there are many different dialects within any given language. This goes for computer languages as well as for human languages. There are many different computer languages. There are many dialects within any one computer language.

Differences in computer languages are mostly brought about by their use or function. FORTRAN, for example, (its name stands for FORMula TRANslation) was designed for use by scientists. In fact, they were usually the only ones to access to computers back in the 1960's. In those days, computers were made of tubes and transistors instead of the large scale integrated circuits used in the mini and micro computers of today. And because scientists use numbers extensively, FORTRAN was designed with number handling in mind. It is a great language for processing large quantities of numbers, what is called number crunching. It can work with integers (whole numbers), real numbers (floating point numbers), and complex numbers (imaginary).

FORTRAN example:
C — READ THREE NUMBERS AND PRINT THE SUM.

```
C — READ (5,100)X,Y,Z
100 — FORMAT(3F10.2)
      SUM=X+Y+Z
      WRITE(6,200)SUM
200 — FORMAT(F10.2)
      STOP
      END
```

Differences in computer languages, and especially among the different dialects can be caused by the wide range of hardware used in today's computer systems. ATARI software is geared heavily towards color graphics and sound effects. A Radio Shack TRS-80 does not have the software to run such devices because it does not have the necessary hardware. It would be a waste of time for everyone involved to write software for hardware that is not available.

The only thing that FORTRAN is not very good at is working with character strings. It does have some elementary string handling abilities, but they are mostly for labeling the printed data. It is just not very good at handling more complicated string manipulations. This brings us to another very important language.

Its name is COBOL. If there are any loyal fans of the now cancelled and sorely missed television series "BATTLESTAR GALACTICA" reading this, they will no doubt think that I am talking about the planet on which all human life is supposed to have evolved. However, since I am talking about computer languages, I must mean COBOL (COMMON Business Oriented Language).

COBOL is not a very good language for number crunching. It was not meant to be. Instead it keeps inventories for department stores, prints out reports on productivity, updates medical records for hospitals, as well as other business activities. COBOL is designed for a business environment, unlike FORTRAN which is geared towards scientific applications. It is a very wordy language. You can read a COBOL program like a chapter in a book and understand what is going on.

COBOL example:

```
START.
  OPEN INPUT MASTER-IN OUTPUT
  MASTER-OUT.
  NEXT-RECORD.
  READ MASTER-IN RECORD AT END GO
  TO FINISH-IT.
```


MOVE HOURLY-RATE IN PAYROLL-IN
TO HOURLY-RATE IN PAYROLL-OUT. MOVE
HOURS WORKED IN PAYROLL-IN TO
HOURS-WORKED IN PAYROLL-OUT.
MULTIPLY HOURLY-RATE IN PAYROLL-
OUT BY HOURS-WORKED IN PAYROLL-OUT
GIVING PAY-CHECK. WRITE PAYROLL-OUT.
GO TO NEXT RECORD.

FINISH-IT.

CLOSE MASTER-IN MASTER-OUT.

There are a couple of reasons I can think of, on why you are not likely to see any of the above languages gracing your ATARI computer. There is very little call, and even less need, for programs like COBOL or FORTRAN on such a small and inexpensive system. Now you might consider the \$500-\$1,000 that you spent on your system so far to be a lot of money. It is, but there are computer centers out there that spend that much in a month on electricity alone. By their standards, an ATARI computer system and anything that is remotely like it is a little toy. Luckily, you and I do not think this way and are having the time of our lives with these toys.

These corporate executives with their big machines have tens of thousands of dollars to spend on business and scientific software. We, on the other hand, just do not have this kind of cash to throw around. Even in a microcomputer environment, FORTRAN is selling for about \$400 and COBOL costs twice that at \$800. These items cost big bucks. No wonder they will not likely be found in any future catalog put out by ATARI.

You probably will not be able to use these big computer languages on your ATARI because they are just that, Big. Memory requirements run up to 48K of RAM (random access memory), which completely fills up an ATARI 800. And a model 400 is out of the race completely with its memory limit of 16K of RAM. The fact that FORTRAN and COBOL are disk based programs makes them even less attractive. This is no problem for those among us who have bought a disk drive or two, but that is maybe 10% of all ATARI owners. If it were possible to use cassette tape, it would take hours, even days, to get a program running. Indeed, there are far too many problems involved to call for the implementation of these languages at this time. Don't get me wrong. If someone should come out with either language in a small and inexpensive form, I will be one of the first to buy it. But I will not be caught holding my breath, waiting for that day.

A language in which programs can usually be written in minutes is BASIC (Beginners All-purpose Symbolic Instruction Code). This language is implemented on just about every computer made today, large or small. BASIC as written for our ATARI computer is an interpreter. This means that the programs we run are kept in the computer's memory where BASIC analyzes them and performs the necessary actions. Its operation is usually quite slow compared to other languages, but it has the

advantage of ease of program modification and is very easy to learn.

BASIC example:

```
10 REM ACCEPT 3 NUMBERS AND PRINT
THE SUM
20 REM
30 INPUT A,B,C
40 LET S=A+B+C
50 PRINT S
60 END
```

Now, how does one go from super slow to lightning speed? The answer is to write your programs in machine language, the language of the computer. In this way, you can achieve the fastest execution time possible and make the best use of available memory resources. To attain this goal you must think like the machine thinks. If you can break down to the smallest detail what you want the computer to do and just how you want the computer to do it, you have the problem solved. Now, not too many of us can think on the level that our machines operate at. For example, who is going to remember that the instruction to jump to a subroutine is 32, or to store value in memory you use 141. There are about 150 such instructions, known as opcodes, in the 6502 instruction set (the 6502 microprocessor chip is the one used in all ATARI computers and Video Game systems). If you were to try to program something large, like Star Raiders in machine language, you probably would be put away in an asylum. Luckily for us, someone came up with a system to remember these instructions called MNEMONICS.

With mnemonics, machine language comes very easy. Instead of having to remember that number 32 is to jump to a subroutine, all we have to remember is JSR. And number 141, to store data is simply STA. This is indeed a marvelous system to work with. Great things have been done and can still be done with it. But there is one little problem. The computer hasn't the first clue as to what you are talking about. It doesn't understand JSR's and STA's. It can only understand the 32's and 141's. What we need is a program that the computer can understand; that will convert into its language what we understand. This program is called an ASSEMBLER. It is rumored to contain a text editor, an assembler, and a debug program. The Editor is used to create text files in the computer's memory that can be saved on either cassette or disk. It will likely have the editing functions available in the BASIC cartridge. The Assembler will do the conversion from mnemonics to computer code for you. The Debugger is a program to keep you in control of a machine language program. You will be able to examine and modify registers and memory locations, and trace a program's execution.

The following programs retrieve two values from the computer's memory at locations 1 and 2, adds them and stores the answer in memory location 3. The first is written in machine code and the numbers

are represented in the format known as hexadecimal notation or hex for short. While decimal numbers are represented by the digits 0-9, hex numbers have 16 combinations. The possible hex digits are 0-9 and A-F. So our JSR and STA from the description on mnemonics which were represented in decimal as 32 and 141, become 20 and 8D. The second is an Assembly language version of the first. Notice how much easier it is to comprehend what is going on over the machine coded version. This program will run a thousand times faster than BASIC doing the same thing.

Machine code example:

```
A5 01 18 65 02 85 03
```

Assembly language example:

```
LDA 1 ; LOAD LOCATION 1
```

```
CMC ; CLEAR CARRY BIT
```

```
ADC 2 ; ADD IN LOCATION 2
```

```
STA 3 ; PUT IN LOCATION 3
```

Listing from ASSEMBLER:

```
A5 01 LDA 1 ; LOAD LOCATION 1
```

```
18 CMC ; CLEAR CARRY BIT
```

```
65 02 ADC 2 ; ADD IN LOCATION 2
```

```
85 03 STA 3 ; PUT IN LOCATION 3
```

The language PILOT will be available along with the ASSEMBLER cartridge this year. PILOT is what is known as an instructional language. It is used for teaching many subjects in both high school and college. It is essentially a question and answer language. PILOT asks questions of a student, accepts answers, checks if the answers are correct, and informs the student. It can then either ask the same question again or go on to another. An example might be to ask you to name a computer language mentioned in this article and then check to see if you were paying attention.

PILOT example:

```
*STRT
```

```
T : NAME A LANGUAGE THAT STARTS WITH "P"
```

```
A :
```

```
M : PILOT, PASCAL
```

```
Y : VERY GOOD. YOU ARE RIGHT.
```

```
N : YOU WEREN'T LISTENING. TRY AGAIN.
```

```
JN: *STRT
```

The last language that I know is due from ATARI is Pascal. This is currently my favorite language, with ASSEMBLY coming in a close second (I go crazy over fast execution speeds). Pascal is a very exact language. All variables must be defined in the program. It is also harder to learn than BASIC. But once you have this language mastered, you will be able to think in Pascal. It is usually referred to as a structured language. This means among other things that it is a GOTOless language. While GOTO statements are allowed in some cases, heavy dependence is a sign of poor programming. It is possible to write large and intricate Pascal programs without using a GOTO statement even once. Another plus factor in favor of the language is that it executes up to five

times faster than a BASIC program doing the exact same thing.

Pascal example:

```
PROGRAM DEMO;
```

```
VAR
```

```
X,Y,Z,SUM:INTEGER;
```

```
BEGIN
```

```
(*REPEAT UNTIL SUM = 0 *)
```

```
REPEAT
```

```
WRITE ('ENTER THREE NUMBERS');
```

```
READLN(X,Y,Z);
```

```
SUM := X+Y+Z;
```

```
WRITELN ('THE SUM IS',SUM)
```

```
UNTIL SUM = 0
```

```
END.
```

An article for a computer magazine is a very easy thing to write. In only a couple of days you are on your way to fame and fortune. Well maybe not fortune, but just think of how proud you will be when after hours of trying to explain to your Aunt and Uncle, why you bought the computer in the first place, you produce the issue of ANALOG that contains the article that took you three whole weeks to write and show it to them. They will be so impressed that your ideas were accepted for printing that they will just have to take you seriously from then on. So compose that article or write that program. It does not matter if you think it was done before. This is a new publication, with a new readership. These people haven't heard it before. And it doesn't matter if your spelling is terrible. These articles are proofread before being printed. It will be fixed up. If your ideas are important to you, they are important to us, and are worth printing. All it takes is a pen and paper. □

ATARI OWNERS SCREEN PRINT INTERFACE

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A series of self paced instructional programs for elementary school children. The programs in this series automatically advance to the next unit when the child has mastered 80% of the work generated by the computer. The previous unit will be reviewed if the child cannot master 50% of the work in a particular unit. Each unit builds on the skills developed in the previous unit.

MATH FACTS - LEVEL I \$15.00
(16K BASIC, grades K-2) Concepts covered in this level are: numbers, number placement, number words (1-20), addition and subtraction (visual and abstract).



MATH FACTS - LEVEL II \$15.00
(16K BASIC, grades 1-3) The child is guided graphically throughout this level. In the addition and subtraction units, the column on the right **MUST** be added or subtracted before the column on the left. This level includes: Number sequences to 100, greater than/less than (1-100), addition and subtraction (2 and 3 columns).

MATH FACTS - LEVEL III \$15.00
(24K BASIC, grades 2-4) High resolution graphics aid the child in learning how to carry and borrow. Units in this level include: addition (3 number in one, two or three columns), addition (with carry) and subtraction (with borrow).



COMPUTATION/TONAL ENCOUNTER \$15.00
Two memory building programs on one cassette. **COMPUTATION** is a "concentration" game for two players. Match the equation behind one of the boxes with the answer or an equal equation. Each of the eight levels of play helps develop the child's addition, subtraction, multiplication or division skills. **TONAL ENCOUNTER** - play back the melody that the computer composes. Contains five different skill levels and an auto mode.



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Tank Trap
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Quality Software has been living up to its name from the looks of the three game programs they have available for the Atari. Tank Trap is my favorite, or is it Tari Trek, or maybe Fastgammon. Well, anyway I'll try and make up my mind at a later date. For now I'll give you my review of Tank Trap.

In this particular game you are a combat engineer with the task of building concrete barriers in an effort to surround and contain a rampaging tank. Once surrounded the tank will try every possible direction to escape, and once it realizes its predicament it will surrender, play a victory tune, and award you with your rank. (The smaller the area containing the tank, the sooner it will surrender.) However, if you get run over in the process they'll be playing taps.

There are four levels of play. On the first level the tank cannot penetrate the barriers, but you can climb over them. At the second level some of the concrete is slow curing, and the tank can break through before it cures. At level three you have randomly placed civilians to protect (if the tank runs over any of them you lose.) In the most difficult level the tank can shoot the barriers in an effort to escape. The best way to trap him in this level is to surround him with a double wall.

Music, color, sound, and graphics add to the excitement which helps make this game very addictive. Another nice feature is the use of demonstration modes which lets the computer run through a complete game. Tank Trap is written in Basic with machine language subroutines. If you are a game fanatic like myself, this one is a must. □



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As long as readers show an interest in this column, it will be a regular feature and will contain listings (notes) for various scores and arrangements of popular music. However; this being the first issue; I felt that it would be wise to use the following pages to explain some of the basics of reading music. Personally, I didn't know a thing about musical composition until ATARI released the Music Composer cartridge.

Since owning an ATARI, my wife noticed that our expenses were slightly higher than normal. Not because of my obsession for software or my excessive use of electricity, but because of the increased number of long distance phone calls. Our phone bill began to resemble a 48K program listing. I became one of the many ATARI owners who found themselves getting a little impatient for new software. Don't get me wrong! I was completely satisfied with spending many late nights battling Zylons. It was just that everyone I knew had seen Star Raiders and I wanted something new to show off. So I started a phone directory that listed every ATARI dealer within a 75 mile radius, and would call at least one dealer every day. One afternoon, without warning, a voice on the other end said "We just received a shipment of Music Composer cartridges." I had to have it that day even if it meant driving 50 miles and charging it to Master Charge. I didn't even care what Music Composer did. I had to have it!!!

I finally made it home alive (I found it very difficult driving and reading the manual at the same time.) I plugged it in and flipped the power switch... WOW! Edit, Arrange, Save, Retrieve, DOS, Listen, what's this?... Copyright 1979! What took so long! After an hour of going through the sub menus, I decided that if I expected to hear some music, I'd have to spend a little more time with the manual (Ugh.) Another hour and forty-five minutes later, I felt as though "Row, Row, Row Your Boat" would never take the place of Star Raiders. I even tried composing a few simple tunes, with little success. Maybe I could bring it back to the store where it was purchased and explain to the sales person that my wife had already bought one for me. I decided to sleep on it and give my musical sister a call the next morning. Perhaps someone with a background in music could figure it out for me.

She stopped over the following day, and with a little embarrassment I showed off the Row Row composition and explained how the program worked. She wanted to try her luck at it and asked for a request. I just happened to have the sheet music

for Star Wars. She thought that perhaps the Star Wars theme was a bit too complicated for her first attempt, but she'd give it a try. She told me that it would take her quite a while to finish the whole arrangement, so I decided to do a few chores around the house. Well, about two hours later, she called back into the room and said "LISTEN". It was fantastic! I couldn't believe my ears. How did she do that?

It took a few days of practice and a lot of trial and error, but with a chart she drew and a few lessons on reading music, I felt as though I wasn't such a musical dummy after all.

The chart (figure 1) shows examples of note placements with their appropriate letter name: C, D, E, F, G, A, B, or R (rest), and octave (3 through 6). However, you must also include the note duration, (Whole, Half, Quarter, Eighth, Sixteenth, or Thirty-second note.) Also included is a listing of rests with their computer accepted abbreviations. The duration of a rest is equal to the duration of the note it replaces, i.e. an Eighth note and an Eighth Rest have the same duration. Accidentals (Sharps, Flats, or Naturals) are also important when composing or copying sheet music and may be part of the key signature at the beginning of every line of music, or written in front of the notes which are to be changed. The Sharp sign (#) raises a note, the Flat sign (b) lowers a note, and the Natural sign (n) contradicts (cancels) the effect of an Accidental Sharp or Flat in the same line preceding the Natural or in the Key Signature.

Musical sounds, or NOTES, are named after the first seven letters of the alphabet (A-B-C-D-E-F-G) after G, the note name starts again at A. After every eight notes there is another note with the same name. These notes are given the same names because they sound very similar, in spite of being higher or lower than each other. All notes are not used for every instrument or voice. So to make it easier to read and understand, music is divided into two parts, one for higher voices and instruments, and the other for lower.

Signs called CLEFS tell us whether the music is for high or low voices and instruments. Normally two Clefs are used and one is shown at the beginning of every line of music. The Treble or G Clef is for the higher voices and instruments. The Bass or F Clef is for the lower. Most sheet music for piano, organ and other keyboard instruments use both Clefs together because they have such a wide range of notes. This type of sheet music is the type that you should look

for when you are considering using your ATARI to play the notes.

All notes are written on sets of lines and spaces called A Staff. There is one Staff for the Treble or G Clef and another for the Bass or F Clef. Each line and space on the Staff is like the rung on a ladder, one note on a line, and the next note higher in the space above, and so on. The higher the note is on the Staff, the higher it sounds. The Clefs help by giving us the position of one note. If you look at the G Clef you will notice that it draws a ring around the second line, which shows the position for the note G. Using the G note as a reference, it is easy to determine the positions of the other notes on the G Clef, remembering that the other notes run in order up the Staff. G is on the line, A is in the space above, B is on the next line and so on. The Bass or F Clef also gives us the position of a note, the F. This time the F note is always located on the fourth line. You will notice that the big dot on the F Clef symbol marks this position.

Notes have many different shapes. Each shape lasts for a certain number of beats which can be counted. A WHOLE NOTE lasts for four beats, which you would count 1-2-3-4, in time with the music. A HALF NOTE lasts for two beats (half as long as a Whole Note) and so on. To make counting easier, music is divided with vertical lines called BAR LINES. Bar Lines do not stop the beat. You should count as if they don't exist and are used to help separate the beats when counting. A DOUBLE BAR LINE marks the end of a piece of music, and can also divide music into sections or Phrases.

Most music has more notes than can be shown on

the five lines and four spaces of the Staff. These notes are written in the areas above and below each Staff on short lines. These notes are worked out in exactly the same manner as the notes we have already discussed. After a while you will come to recognize these notes.

In most music, one or more of the instruments or voices are silent for a few beats. These silent beats are known as RESTS. Rests are counted in the same way as the notes they replace, i.e. a whole rest lasts as long as a whole note and has the same number of beats. Rests can be found at the beginning or end of music, or between the different Phrases of a melody.

When a note is carried on into the next bar, a curved line called a TIE is used. A Tie makes the first note longer by joining it to the note at the beginning of the next bar. Ties can also join two or more notes together in the same bar, and will make the first note last for the combined number of beats of the notes tied together. Ties will only work with notes that have the same name and position on the Staff with no different notes in between. Do not confuse a SLUR for a Tie. A Slur can be used over or under several different notes and means that those notes should be played smoothly.

I could devote this entire issue to the basics of music. However, the information we have covered so far should help most of you in getting started. If you need additional information, refer to the chart or the Music Composer manual. In future issues we will get into music a little deeper and explain what your ATARI is capable of. I will also have a few song listings that you can use. Any requests? □

Fig. 1

Repeat Signs Bar Lines Repeats TIES (T)

BASIC SOUNDS



by Russ Walter

Atari's computer contains four voices; each voice can sing. So you can make the computer imitate a quartet.

The four voices are called 0, 1, 2, and 3. This program makes them sing:

```
10 SOUND 0,127,10,4
20 SOUND 1,101,10,4
30 SOUND 2,84,10,4
40 SOUND 3,63,10,4
50 FOR 1 = 1 to 400: NEXT 1
60 SOUND 3,56,10,4
70 FOR 1 = 1 to 400: NEXT 1
```

Line 10 tells voice 0 to sing pitch 127 (which is "middle C"), using tone quality 10 (which is "pipe organ") and volume 4 (which is "medium-soft"). Line 20 tells voice 1 to sing pitch 101 (which is "the E above middle C"). Line 30 tells voice 2 to sing pitch 84 (which is "the G above middle C"). Line 40 tells voice 3 to sing pitch 63 (which is "the C above middle C"). So line 10-40 make all four voices sing; you hear a chord. Line 50 makes the computer pause for 1 second; so you can hear the chord for 1 second.

Line 60 tells voice 3 to change its pitch to 56 (which is "the D above the C above middle C"); the other voices, unaffected, continue to sing C, E, and G. Line 70 makes the computer pause, so that you hear the new chord for 1 second.

PITCH

The pitch must be a number from 0 to 255, and cannot be a decimal. Here are some popular pitches: 255 is a deep bass note (it's "the C below middle C"; "the C in the bass clef")

127 is "middle C"

63 is a soprano note ("the C above middle C"; "the C in the treble clef")

31 is a very high note ("the C above the treble clef")

15 is very, very high ("the C above the C above the treble clef")

7 is very, very, very high ("the C above the C above the C above the treble clef")

3 is very, very, very, very high ("a C at the edge of your range of hearing")

1 is very, very, very, very, very high ("a C that only your dog can hear")

0 is very, very, very, very, very, very high ("maybe not even your dog!")

To translate traditional music notation into computer pitches, use this chart:

	C	Cl	D	D#	E	F	F#	G	G#	A	A#	B
bass	255	241	227	214	202	191	180	170	160	151	143	135
alto	127	120	113	107	101	95	90	84	80	75	71	67
soprano	63	59	56	53	50	47	44	42	39	37	35	33
very high	31	29	28	26	24	23	22	20	19	18	17	16
very, very high	15	14	13		12	11	10		9		8	
very, very, very high	7		6			5			4			
edge of range of hearing							2					
dogs only	3											
dogs only	1											
not even dogs!	0											

(Note to musicians: to make full use of the Atari's range, I've tuned it slightly flat. For example, 127, which I'm calling "middle C", is slightly flatter than a piano's middle C; in fact, it's closer to the piano's B.)

TONE QUALITY

The tone quality must be 0, 2, 4, 6, 8, 10, 12, or 14. For most music, use 10. The 14 sounds almost the same as 10. The 12 is a buzz. The other tones are used for making the computer imitate guns, bombs, airplanes, trucks, motorcycles, and all the other evil joys of life.

VOLUME

The volume must be from 0 to 15. The 0 is silence; 1 is a barely audible whisper; 4 is soft and sweet and is what I recommend for most four-part harmony. The higher the volume, the more unpleasant distortion you'll notice — especially if you try harmony.

MY FAVORITE COMPOSITION

This program composes exciting music:

```
10 FOR 1 = 0 TO 255
```

```
20 SOUND 0,1,10,4
```

```
30 SOUND 1,255-1,10,4
```

```
40 SOUND 2,INT(RND(O)*256),10,4
```

```
50 NEXT 1
```

Line 10 says that 1 increases. As 1 increases from 0 to 255, the pitch in line 20 goes from 0 to 255; the pitch in line 30 goes from 255 to 0; and the pitch in line 40 is random. So voice 0 goes from 0 (dogs only) to 255 (bass), which voice 1 goes from 255 (bass) to 0 (dogs only), and voice 2 sings random notes. Try it!

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BLOCKED

By David Bohlke

Requires 8K

BLOCKED is a version of a popular arcade game for two players. Each player will control a cursor that moves on the screen in the four cardinal directions; leaving a trailing path as it progresses. The object of the game is to keep your cursor 'alive' by not running into one of the developed paths, or the pre-defined boundaries.

To begin, plug one joystick into paddle slot #1, and another stick into paddle slot #2. These will control the cursors on the left and right, respectively. You will also be able to select one of five speeds, using the stick on the left. The fastest speed requires sharp reactions to survive; while the slower speeds encourage a strategic battle.

Points will be awarded to the player who does not 'crash' his cursor. The point value varies directly with the length of the paths. A game is won when one player scores over 300 points. You may have to adjust the SETCOLOR commands to get the sharpest images on your video screen.

BLOCKED

5-15 directions for stick positions
21-24 change in plot points for different directions
30-81 initialization
A\$ contains LEFT, RIGHT
NG new game flag
LS,RS left, right score
L1,L2 left location
R1,R2 right location
60-65 select random vertical placement
70 check for end of game
72 if NG = 1 then continue game, else new game
81-98 input speed selection
200-230 controls left cursor
200 plot cursor
205-210 get direction change
220 ran into wall
230 plot new position, delay time loop, increment score
400-490 controls right cursor (same as left)
600-610 right wins
700-710 left wins
900-940 end of game message

2 REM BLOCKED

```

3 GOTO 38
4 RETURN
5 RETURN
6 RETURN
7 D=1
8 RETURN
9 RETURN
10 RETURN
11 D=3 RETURN
12 D=2 RETURN
13 D=4 RETURN
14 D=4 RETURN
15 RETURN
21 X=X+1 RETURN
22 Y=Y+1 RETURN
23 X=X-1 RETURN
24 Y=Y-1 RETURN
38 DIM A$(7) : NG=0
40 GRAPHICS 1+16
41 SETCOLOR 0,15,10
42 SETCOLOR 1,12,9 SETCOLOR 2,8,9
43 POSITION 0,0 PRINT "G.L.S."
44 POSITION 17,0 PRINT "G.R.S."
45 POSITION 7,0 PRINT "G.S.D.S."
52 COLOR 13: PLOT 0,1: DRAWTO 19,1: DRAWTO 19,22
54 DRAWTO 0,22: DRAWTO 0,1: S=0
60 L1=2: L2=INT(RND*(X/15)+3): LD=1
65 R1=17: R2=INT(RND*(X/15)+3): RD=3
70 IF (LS>300) OR (RS>300) THEN G1
72 IF NG<0 THEN 200
81 NG=1: LS=0: RS=0: SOUND 0,0,0,0
83 POSITION 6,5 PRINT "G.BLOCKED"
84 POSITION 2,9 PRINT "G.mess left stu
ck"
85 POSITION 2,11 PRINT "G." to select are
ed."
86 POSITION 2,13 PRINT "G." "TEXT PRESS T
EXT"
90 T=1
91 POSITION 6,17 PRINT "G." "SPEED "T": F0
R 1=1 TO 100 NEXT 1
92 IF STICK(0)<15 THEN T=T+1 IF T>5 THE
N T=1
96 IF STICK(0)>0 THEN T=T+10 GOTO 40
98 SETCOLOR 3,RND(8)+15,RND(8)+10: SOUND
0,RND(8)+250,10,5 GOTO 91
200 COLOR 11: PLOT L1,L2
205 P=STICK(0): D=LD: GOSUB P: LD=0
210 X=L1: Y=L2: GOSUB D=20
220 L1=X: L2=Y: LOCATE L1,L2: IF PC<32 TH
EN 600
230 COLOR 10: PLOT R1,R2: SOUND 0,RND(10)+50
,10,7: FOR I=1 TO T: NEXT I: S=S+1
400 COLOR 17: PLOT R1,R2
405 P=STICK(1): D=RD: GOSUB P: RD=0
410 X=R1: Y=R2: GOSUB D=20
420 R1=X: R2=Y: LOCATE R1,R2: IF PC<32 TH
EN 700
430 COLOR 17: PLOT R1,R2: SOUND 0,RND(10)+
50,10,7: FOR I=1 TO T: NEXT I: S=S+1
490 GOTO 200
600 C=X: RS=S+S: A$=" right": GOSUB 900
610 GOTO 40
700 C=Y: LS=S+S: A$=" left": GOSUB 900
710 GOTO 40
900 POSITION 0,23: PRINT "G.RS," wins "S
," "LS"
910 FOR I=1 TO 10
912 SETCOLOR C,RND(1)+15,RND(1)+15
915 FOR J=1 TO 10
930 SOUND 0,RND(1)+200,12,10 NEXT J
940 NEXT I: RETURN

```


HARDWARE REVIEW — KURTA GRAPHICS TABLET

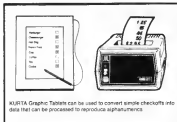
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A fairly new input/output device to microcomputers, and the ATARI in particular, is the graphics tablet. Using a special pen, the tablet with appropriate software, will convert the pen's location into data stored in RAM, or permanently onto disk. The pen puts out a very small 'current' which passes through the paper on the tablet surface, and is received by the circuitry in the tablet, indicating the pen's position. (the current is VERY low — not dangerous).

The ATARI version of the Kurta Tablet is interfaced through a 25 pin connector on the back of the tablet, and input to the ATARI is provided through 'plugs' in the one, two, and three controller jack ports. The only other lines are the AC power pack wire, and the pen's thin interface line. A software package for the ATARI is made up of several command/programs. One very nice one allows you to place a road map or other chart over the tablet writing surface, input the scale, and trace over a route displaying the actual mileage on the screen. This I found to be very accurate.

Another file contains five separate programs. The 'Length' routine "displays the value of X and Y pen coordinates and indicates if the pen is touching the surface, then displays the computer calculated length between two points." 'Area' will give a computer calculated figure of a closed area. 'Sound' will display the pen's location using a sound — an interesting feature, but I have yet to find a practical use for it. The 'Drawing' program will translate what you draw on the tablet into data, and simultaneously display the figure on your screen. This is the greatest application the tablet can be put to use. You would have to write a program to put this data on disk or accessible RAM, however the time you could save drawing an object rather than using the Plot & Drawto commands is incalculable. This mode uses graphics 8. The fifth command is 'Graphics' and will take a drawing on the tablet and turn it into "abstract art". This also is in graphics mode 8.

So the uses a graphics tablet can be put to are extensive, and time saving. The construction of the Kurta version consists of a metal case 34 inches high and 13" x 15 1/4" square. The insert writing surface is a smooth, easily washable plastic. The pen construction is nice, however the wire connecting it to the tablet is rather flimsy. Something like a coil-telephone line would be nice. Also, the power transformer setup looked rather non-professional; not sturdy looking. Software-wise, the only fault I found was a nuisance — when drawing on the tablet for a short while, the screen would go into the 'attract mode'; changing colors while I was still



KURTA Graphic Tablets can be used to convert simple checkoffs into data that can be processed to reproduce alphanumeric

drawing. So just hit a key you say, to stop it? No thanks, the 'menu' for the commands is accessed by typing a key. So if I did this, my picture data would be lost. You can change the software easily to prevent this, but for the extra 100 dollar software change, this shouldn't be necessary.

Taking an overall look at the Kurta Tablet, the only major fact I dislike is the price. The six hundred dollar price tag seems a bit steep for the hardware you get, and at that price, I really can't see paying the extra 100 dollars for the described software package — this should be included in the price at the very least. But like I mentioned, the time saving convenience cannot be disputed. □

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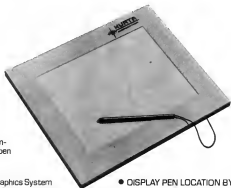
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SOFTWARE REVIEW:

MOUNTAIN SHOOT

Adventure International
P.O. Box 729
Casselberry, FL 32707
16K Cassette \$9.95

Mountain Shoot is a two player shoot-em-up games that pits one player against another. As the name implies each player must shoot at their opponent over a randomly plotted mountain. The height, width, and location of the mountain and cannon locations differ with each game, after games the player with the highest score wins. Players take turns plugging away at their opponent. Sound easy? Not really. You must determine the angle (0-90) and the amount of powder (0-99) needed to reach your opponent's cannon. If that's not enough, you have to compensate for the wind speed, that comes from the east or the west. The game has three levels of play and an option to choose a powder limit. The most difficult game level has the strongest winds and most difficult mountain locations.

I was impressed at the way the audio track was used to explain the game instructions, and the listed instructions at the beginning of the game. However, after the first couple of times I loaded it, I found



myself becoming a little impatient, and, therefore, saved the "game only" on another cassette. The only gripe I have against the game is that each player must use the keyboard to enter the powder number and angle. So, make sure that you're very friendly with the person you're playing against (or would like to be), because both players have to be positioned close to the computer.

Mountain Shoot has great sound and superb colors with every level of play providing a challenge. Well worth the \$9.95 price tag. □

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SOFTWARE REVIEW — IRIDIS #2 Tutorial
The Code Works
 Box 550
 Goleta, CA 93017
 805-967-0905

This software package was the first major, high quality piece of software received at the ANALOG offices. What it basically does, is alter the character generating of the ATARI computer. The standard character font (style of lettering) in the ATARI is hardwired into the system — but this program overlaps it allowing you to design, save, and use your own custom created characters or graphic shapes. Your character set can be saved on diskette and later retrieved to use again.

FONTEdit is the program that allows you to do what I have just described, and it really is "friendly and easy to use." The layout on your screen consists of a matrix in the top left corner — a small rectangle of dots, with an expanded version of the character you are altering, set in that box. On a 15" screen, the letter 'A' for instance, is about 2" high. To the right of this box, are several repeated lines of the character being altered, to give you an idea of how that character would appear surrounded by characters its own size and shape. This is to prevent you from making characters so large they make contact with others (unless you want to do this). Below this is a list of all the upper and lower case, special graphic shapes, and the other characters (!@#\$%, etc) produced by the ATARI. You move your joystick to the character you want to change, hit the red button, then modify that character on the "dot matrix" in its expanded form. As you change that character, any other letter on the screen will change with it. As you alter the letter 'A', all the upper case A's on the screen (ex: the A's in the word ATARI), will change also. When finished changing a character, just push the joystick button again and move on to another letter/shape, or save it.

Along the right hand side of the screen, are a list of commands allowing you to copy characters, edit them, erase all you have done and start from scratch, move an entire character in any direction (say, move the letter 'A' slightly to the right), and save/load your own fonts. As you load a previously saved font, a cursor rapidly moves about the screen changing the character set. All the A's change the same time, the B's next, and so on. This happens very fast and in just a few seconds your entire character set is new! You can list the FONTEdit program in your new set to see how it looks in "large quantity", but when you hit "System Reset" or load a new program, this new font will be deleted and the standard set will replace it. A small program included in the manual, when placed at the end of one of your own programs requiring your special font, will load your font up and you can use it without having to run the entire FONTEdit program again. Also two pre-written fonts include a computer letter design, and a fancy version of the ATARI characters.



The manual accompanying this program is actually a small magazine — included are sections on various aspects of the ATARI. Memory locations, "rumors" about the ATARI, and general notes on the ATARI; very professionally put together.

A second program is included on the cassette or disk, KNOTWORK. This is a pre-written font, which displays a red and blue pattern on the screen you can modify to design your own "Celtic Interlace" pattern. This too, is easy to use, and can be saved for future recall, to display again later. Some interesting and beautiful patterns can be designed; this interlacing was "used by 7th century Irish monks to illuminate manuscripts."

This tutorial is recommended for any ATARI user who wants to understand the workings of his computer better, and have a great time designing characters and patterns. Available on cassette and diskette, 16K required for cassette, 24K with disk use. □

..... @	A ATARI
.....	C COPY
.....	E EDIT
..... @@@@	F FONT LIST
..... @@@@	L LOAD FONT
..... @@@@	Q QUIT
..... @@@@	R REVERSE
..... @@@@	S SAVE FONT
.....	U UNDO
	↑ ROLL UP
	↓ ROLL DOWN
	← ROLL LEFT
	→ ROLL RIGHT
	CLEAR ALL DARK
	JOYSTICK TO MOVE
	BUTTON OFF ↔ ON
	LIST OF COMMANDS

***** ATARI SOFTWARE *****

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 Jacksonville, FL 32211

FONTEDIT

Fontedit

FONTEDIT

FONTEDIT

FONTEDIT

Fontedit

With FONTEDIT you can design your own character sets (or fonts) for the ATARI. For example, you might create a Russian alphabet, an APL character set, or special-purpose graphic symbols. After you design your character set, you can save a permanent copy on disk or cassette tape for later use. (We include a separate subroutine that you can use in your own programs to load a custom font from either disk or tape.)

Best of all, with FONTEDIT it is really easy to create a new character set (or just modify the existing ATARI characters). FONTEDIT shows you an enlarged copy of the character that you are designing. You move a cursor around within the big picture of the character, and turn the individual dots on or off with the joystick

button. In addition to seeing a large version of the character, you are shown a group of the characters together, as well as the entire character set as currently defined. For ease of use, each of the FONTEDIT commands are shown in a menu on the right-hand portion of the screen. FONTEDIT is friendly and easy to use: just grab a joystick and become a font designer! (Requires 16K memory with cassette, 24K with disk.)

KNOTWORK lets you design patterns of Celtic interlaced (a technique used by 7th century Irish monks to illuminate manuscripts). When KNOTWORK is first run, it covers the screen of the ATARI with an unadorned knotwork pattern. You use the joystick to move an arrow around on the screen. When you press the button on the joystick, a small vertical or horizontal line appears (called a *braak* by the monks). It sounds simple, and it is! With some creativity, you can produce beautiful patterns that look like woven rope. Naturally, you are able to save a copy of the screen on tape or disk, and then load it back later. As you might expect, KNOTWORK uses custom graphics characters that were originally designed with FONTEDIT. (Requires 16K with cassette, 24K with disk.)



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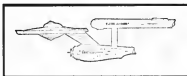
FIVE STAR TREKS, COUNT EM, FIVE!

By Lee Pappas

Space, the final frontier... if we spend all of our time playing these five versions of Star Trek we will never make it that far. Star Trek was the first computer-craze game to sweep the nation. Every computer in every school had (and still has) a version of the game based on the adventures of the Starship Enterprise. The ATARI versions make any other computer variations of the game look simple. The chart below shows differences in the games and also is a list of those companies producing the games.

Basically the object of the game is to rid the galaxy of the dirty Klingons. In the Adventure International version you must explore all class M planets, and destroy the Klingons only when you are in danger of them attacking you. The Dynacomp Star Trek has the Klingons move if you don't act, and they also hide behind planets making you think it is a standard cruiser, when in actuality it is a powerful battle-cruiser. The best graphics/sound combination comes from Adventure International by far. Actually their game borders on a mini-adventure in that the game could take a while to complete. It even has a save-game feature allowing you to save the game up to the point you are at, and later reload it progressing from that point rather than starting from the beginning. The detail in this game is really fascinating — it's almost a Star Raiders without the action; the graphics are that nice.

Quality Software's Star Trek comes in second. Their version is 'clean' looking and takes less time to complete than the Adventure International Trek.



They just improved it by adding a Galactic Map, which the original did not contain. If you don't have the time to play a long game, this is the one to use. The graphics are minimal, however the sound effects are quite nice. Dynacomp's Trek can be tricky to play. It is certainly more difficult to win than are the others, strategy is important as well as being familiar with the game.

Creative Computing's advanced Star Trek is a very expanded version of the original computer Star Trek. All the standard options and rules apply. The 'I couldn't believe it' award goes to Color Software for the slowest computer game I have ever seen. This "3D Trek" is great if you have trouble falling asleep. Or maybe you can make a move in the morning before you leave, and when you return the computer will have made its' move (an exaggeration, but it is VERY slow). Plus the instructions for the game are rather vague as to what's going on. Too bad, the game looks as though it could have been nice. Oh well.

Getting just one of these games isn't enough. I prefer the first two, however the Creative Computing version and Dynacomp 3.2 Trek contain features the others don't. The other one — forget it!

★ ★ ★ ★ ★ COMPARISON CHART OF STAR TREK GAMES ★ ★ ★ ★ ★

	Adventure International Star Trek	Color Software Star Trek 3-D	Creative Computing Star Trek	Dynacomp ST 32	Quality Software TanTrek
Graphics Mode	7	7	0/3/5	0	1
Number of Colors	3	3	3	2	4
Sound Variation	extensive	minimal	good	good	very good
Graphics Quality	very good	good	good	fair	good
Length of Game in K	25K	13.2K	15.5K	20K	21.5K
Complication of Game	Very Advanced	Confusing	Fairly Advanced	Better than Average	Fairly Advanced
Special Features	Over 11 commands, save game feature	very slow	nice features, I rate this game third	Klingons are tricky	very fun, not difficult to understand

STAR TREK 3.2

Dynascomp, Inc.
6 Rippingale Rd.
Pittsford, NY 14534
Cassette \$9.95 24K - Disk 113.95 32K

STAR TREK 3.5

Adventure International
Box 3435
Longwood, FL 32750
Cassette \$14.95

3-D STAR TREK

Color Software
5410 W. 20th St.
Indianapolis, IN 46224
Cassette \$15.00 24K

***CREATIVE COMPUTING STAR TREK**

From: Basic Computer Games (No. 6C)
Creative Computing
P.O. Box 789-M
Morristown, NJ 07960
*(must be converted for Atari) - \$7.50 Book

ATARI TREK

Quality Software
6660 Reseda Blvd., Suite 105
Reseda, CA 91335
Cassette \$11.95 24K - Disk \$14.95 32K

**THE ATARI 810 & DOS II**

The ATARI 810 Disk Drive is now supported by the release of the Disk Operating System Reference Manual made available last fall. New drives should be coming through with this manual. A new version of DOS, DOS II, Version 2S, will be available soon for the 810. This new version has a number of differences over the original DOS. DOS II takes up less memory, as it doesn't reside in RAM along side your BASIC or ASSEMBLY language program. When you type in the DOS command, your program in RAM is swapped to a file on diskette — the "MEM.SAV" file. Then DOS is put in RAM for your use. Type "B" and DOS is erased from RAM, and your program is put back in RAM. This allows you to use more RAM for programming rather than have DOS use up 9 or 10 K.

DOS II does away with the 'N. DEFINE DEVICE' function. 'N' will now create a new "MEM.SAV" file on diskette. You also won't have to return to the MENU on DOS after you execute a command, you can just type in a new command, or hit 'RETURN' for the MENU listing. The four files comprising DOS II are: DOS.SYS, DUP.SYS, MEM.SAV, & AUTORUN.SYS. Also, some formatting on DOS II is not interchangeable with DOS I. You can run into difficulty renaming a DOS I formatted diskette on DOS II (the file name storage differs slightly). DOS II supports the point/random access functions on disk now.

You may notice how reliable your disk drive is in the way it never loses data transferring from diskette to RAM or visa versa. When data is taken to or from diskette, a 'counter' checks to see that the number of bits transferred matches what was originally in the file or program.

*Note that when the final version of DOS II is released, some of what has been described may change. □



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HOW TO BECOME A STAR COMMANDER

By Lee Pappas
Star Commander, Class I

ATARI's Star Raider cartridge contains the most advanced computer graphics game in the world. This certainly shows up in the advanced graphics and the complexity of the game. It took 10 months for Doug Neubauer to write the program, and several more for ATARI to finish and polish it up. I have spent over 100 hours playing Star Raiders and I hope some of what I have learned will assist you.

This preflight summary won't make you a Star Commander, Class One for certain, but it may help. The only sure way to make it to the top is to play the game until you finally reach top rank. But don't try this on the Novice level. For the first time users this level is fine to learn the basics of the game, but according to the formula that figures out your final rank, it is near to impossible to achieve the higher ranks. Having completed a game at this level using only 2550 units of fuel, no shields or engines (except Hyperspace), firing only 1 torpedo per ship, and finishing in 2.45 stardates, I end up with only Lieutenant for a rank! Plug these figures into the formula and you'll see why.

The Commander level represents the final challenge in Star Raiders. The point of the game is to work your way up from the low ranks until you finally reach the honor of Star Commander, Class One. (Actually the game was written to have fun!).

Rule one, and the most important, is to take advantage of a ballistical flaw in the game; the ability of the photon torpedoes to destroy a target out of its plane of trajectory. This means a target can be annihilated by a photon when in reality the torpedo shouldn't have hit it (i.e. the photon will strike objects out of its flight path). This sounds confusing, but look for this and you'll understand. If not for this occurrence I wouldn't hit ships half the time I actually do.

Another helpful time/energy saving trick is to keep track of where your starbases are in relation to your position. If you lose your shields and need to get out of a sector fast, you can just hit "H" and arrive at a nearby base without using the Galactic Map. This is explained in paragraph three of the Survival Tactics section on the instruction manual's last page.

And never let those blood thirsty Zylons destroy your base (a nasty thing to do). Not only do you lose lots of points, but those slimy little aliens build two more ships from the rubble. Therefore, if your base is in imminent danger, destroy it yourself. You lose less points and you have two less ships to worry about.

If you lose your port (left) torpedo and still have a functional starboard (right) photon, you can actually do better than with both fully operational!



After all, the Zylons only have one bank of torpedoes and they don't do so bad. One torpedo resets faster than two, and you can zap those Zylons faster with one side in a rapid fire pattern. Don't forget, each photon expends 10 units of energy. (A volley of two uses twenty).

Use the Attack Computer lock-on-target feature mostly on basestars. Close in on them centering it in the cross hairs, and hit that button when the computer locks on. With the fighters and cruisers you are better off using manual firing. I never use the Pause control except to answer the phone, etc. To use the Pause to gain extra time studying the Galactic Map is cheating. In real life you couldn't do this so you shouldn't do it in Star Raiders.

If you lose your Computer and Engines, it can be difficult to close in on the Zylons as they tend to run. You can hit "H" to close in on them while using Long Range Sensors to monitor heading (if LRS are operational), then abort when in range, but every time you hit that Hyperspace key, even accidentally — you use at least 100 units of energy.

And don't jump more than five sectors at a time on the Galactic Map. The warp energy jumps from 250 units to 500+. Also observe the time before making the jump to hyperspace, the Zylons move on increments of .00 and .50. The best velocity to use during battle/cruise mode is 6, and on interception of far off ships, 9. Saving time is as important as saving energy! Open fire on the Zylons when their range is 120 units. Aim for them, then tilt your ship to make your torpedoes contact the Zylon ship (except for basestars). You have a good chance of hitting the ship; and at that distance, the Zylon torpedoes dissipate before reaching your ship.

If the Zylons get above your cross hairs, bring your ship up. You rarely can hit the enemy ship at that position. The real danger comes when you have a Zylon ship aft and another forward. The best tactic may be to shut down the Tracking, destroying the forward ship, then the aft attacker.

When entering a sector containing a starbase, lower your shields, as there are no enemy ships or asteroids in that sector (unless your base is blown up). As for colliding with asteroids there usually isn't much you can do. The only time I was destroyed by an asteroid my ship was travelling at velocity 98, and that close to light speed, contact with an asteroid makes for an interesting sight as you watch what's left of your ship take 20 seconds to come to a stop! So, use all of these techniques to kill the Zylon menace, and with lots of practice you will stop those savage murderers from killing your loved ones on the starbases you are protecting. Now fire up the star drive and blast those Zylons into space jelly! □



VIDEO COMPUTER SYSTEM UPDATE.....

Over three years in production, the model CX2600 Video Computer System is still the largest selling home video game on the market. And not to slip to the number two spot, ATARI continues its support of the unit with four great games released in late '80, and four new ones for the first quarter 1981.

The addition of Asteroids, Warlords, Video Pinball, and Othello bring the total number of cartridges to 42, with more to come later this year.

Asteroids brings the popular arcade game into your home as you protect your ship from onrushing asteroids. Your ship has only four lives and you lose one whenever hit. You can vary the game by regulating asteroid speed, putting up shields, entering hyperspace, or flip your ship around 180 degrees.

Warlords is an action/thinking game where you protect your king, who hides behind his castle, against up to three other players. You must also destroy the opposing kingdoms to win. There is a deadly ball you must capture or deflect, and you can play with double shields.

Video Pinball is an exciting version of arcade pinball where you have one or two flippers, varying ball speeds, and great sound effects. You can also 'nudge' the ball — too hard though and you'll TILT, losing the ball. For one or two players.

Othello is the game said to be somewhere between chess and checkers. By jumping opponents' pieces, they become yours. When the game 'board' is filled with pieces, the player with more of his colored squares on the screen wins. □



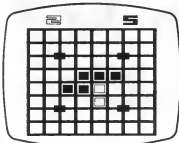
WARLORDS™ Game Program™



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ASTEROIDS™ Game Program™



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MAZE RIDER

by Charles Bachand

Requires 16K

Did you ever get that hemmed in feeling? Your job is beginning to get to you, and there is no escape in sight? Or you just can't stand closed in places? Or if driving through anything that resembles New York City puts you into shock, this game is probably not for you.

You might have seen programs that draw mazes. These are not uncommon. The program draws an overhead view of a maze, and you and a pencil try to find the way out. It is easy because you have the whole maze there in front of you. Let's make things hard. What if you couldn't see the whole maze? A little harder. You can look at the maze only three times. "What next?", you ask. Well, I'm going to tell ya. We're going to put you in the maze with walls all around you. How do you like that? Now try to get out! Or in the words of Darth Vader, "I have you now".

And now for a few words on how to play the game. First, you need a joystick inserted into controller jack #1. Moving the stick forward moves you forward in the maze, and pulling back on the stick puts you in reverse. Turning either left or right is accomplished by pushing the stick left or right, and the red button on the joystick allows you to glimpse a map of the maze. You can only look at it three times, so pay attention. To escape, you must find the glass panel that covers the exit and smash through it.

You may select certain options when you start the game. The map option allows you to look at a map of the maze up to three times. The tire trail option leaves a trail on the ground where you have been. The hole in the wall option puts random holes in the walls about you to make it easier to get where you are going. And finally, there is the motorcycle sound option, for people who can't stand all the noise.

Now, let me see if I can remember how this game works (this is what happens when you don't add REM statements).



LINE	EXPLANATION
10-540	GENERATES AND STORES THE MAZE
600-670	DRAW'S INTERIOR OF THE MAZE
1000-1140	MAIN ROUTINE OF PROGRAM
2000-2020	END OF GAME.
300-3010	DRAW'S MAP OF MAZE
4000	DRAW'S OUTLINE OF MAZE
5000-5080	MAIN TITLE AND OPTION SELECT
6000	DATA FOR PERSPECTIVE VIEWS

```

10 REM *** MOTORCYCLE MAZE RIDER ***
15 REM COPYRIGHT 1980 C.BACHAND
50 GOSUB 5000:GOSUB 4000:PRINT " GENERA
TING MOTORCYCLE MAZE"
80 XC=INT(RND(2)*((WIDTH-3)/2))*2+3
85 YC=INT(RND(8)*((LENGTH-3)/2))*2+3
90 EX=XC:EY=YC:PNTR=1536:YPNT=1632
95 SETCOLOR 1,0,14
100 COLOR 2:PLOT XC,YC:COLOR 1
110 LNG=INT(RND(8)*3)*2+2
120 DIR=INT(RND(8)*4)
130 S=(DIR=0)-(DIR=1)
140 T=(DIR=2)-(DIR=3)
180 FOR I=2 TO LNG STEP 2
190 LOCATE XC+S*I,YC+T*I:P
200 IF P AND I=2 THEN POP:GOTO 110
210 IF P THEN POP:LNG=2:GOTO 130
220 NEXT I:XC=XC+S*LNG:YC=YC+T*LNG
225 IF PNTR>PMAX THEN PMAX=PNTR:MX=XC:MY
=YC:MS=S:MT=T
230 DRAWTO XC,YC:PNTR=PNTR+1
235 SOUND 0,D2-PNTR*8,10,8
240 POKE XPNT+PNTR,YC
250 POKE YPNT+PNTR,XC
290 GOSUB 500:IF P THEN 300
295 SOUND 0,D2-PNTR*8,10,2:GOTO 110
300 XC=PEEK(XPNT+PNTR)
305 YC=PEEK(YPNT+PNTR)
310 PNTR=PNTR-1:GOSUB 500
315 SOUND 0,D2-PNTR*8,10,8
320 IF P AND PNTR THEN 300
325 POKE 77,2:SOUND 0,D2-PNTR*8,10,2
330 PLOT XC,YC:IF PNTR THEN 110
340 COLOR 3:PLOT MX,MY:COLOR 1
350 MAP=ADR(MAP$):IF I-EXTRA THEN 390
360 FOR I=1 TO 25
370 XC=INT(RND(8)*((WIDTH-4)/3)+3:YC=INT(RN
D(8)*((LENGTH-4)/3)+3:IF INT((XC+YC)/2)=(XC
+YC)/2 THEN 370
380 PLOT XC,YC:NEXT I
390 SOUND 0,0,0,0:FOR Y=1 TO LENGTH
400 FOR X=1 TO WIDTH:LOCATE X,Y:P
410 POKE MAP+Y*40+X,P:NEXT X:NEXT Y
430 S=MS:T=MT:MS=0:FOR I=0 TO 6:READ X
:POKE XPNT+I,X:NEXT I:P3=0
440 YPNT=XPNT+8:POKE YPNT-1,79:FOR I=0 T
O 6:POKE YPNT+1,79-(PEEK(XPNT+I)+PEEK(XP
NT+I-1))/4:NEXT I:GOTO 1000
500 LOCATE XC+2,YC:P1
510 LOCATE XC-2,YC:P2
520 LOCATE XC,YC+2,P3
530 LOCATE XC,YC-2,P4
540 P=P1 AND P2 AND P3 AND P4:RETURN
600 P1=0:GRAPHICS 7:SETCOLOR 1,0,14:POKE
752,1:PRINT "PRINT " YOU'RE LOOK
ING ":AS

```

```

610 FOR YC=0 TO 6:P2=NR(1,YC):IF P2=2 THEN
  GOSUB 670
612 IF NOT P2 THEN POP:GOTO 670
615 X1=P1:X2=PEEK(YPNT+YC):P1=X2
620 IF FEET AND YC THEN IF P2=3 AND NR(1,
  YC-1)=3 THEN PLOT 79,PEEK(YPNT+YC-1):OR
  AWT0 79,PEEK(YPNT+YC)
630 FOR XC=0 TO 2 STEP 2:IF XC THEN X1=1
  50-X1:X2=150-X2
635 XD1=X1/2:XD2=X2/2:IF NR(XC,YC) THEN
  650
640 PLOT X1,XD1:DRAWTO X2,XD2:PLOT X1,79
  -XD1:DRAWTO X2,79:XD2:GOTO 655
650 PLOT X1,XD1:DRAWTO X1,79-XD1:PLOT X1
  ,XD2:DRAWTO X2,XD2:PLOT X1,79-XD2:DRAWTO
  X2,79-XD2
652 IF NR(1,YC+1) THEN DRAWTO X2,XD2
654 GOTO 660
655 P2=NR(1,YC+1):IF P2=0 OR P2=2 THEN 0
  RWT0 X2,XD2
660 IF FEET THEN IF YC AND NR(XC,YC)=3 THEN
  PLOT 79,PEEK(YPNT+YC):DRAWTO X1,PEEK
  (YPNT+YC)
665 NEXT XC:NEXT YC:IF NOT NR(1,7) THEN
  IF NR(0,6) OR NR(2,6) THEN PLOT 79,39:P
  LOT 79,40
668 RETURN
670 PLOT X2,XD2:DRAWTO 159-X2,XD2:PLOT X
  2,79-XD2:DRAWTO 159-X2,79-XD2:RETURN
1000 SOUND 1,250,2,SND4:COLOR 1:MAP=ADR
  (MAP$):IF T<1 THEN 1020
1015 FOR XC=-1 TO 1:FOR YC=0 TO 7:NR(XC+
  1,YC)=PEEK(MAP+(MY+YC)*40+MX-XC):NEXT YC
  :NEXT XC:AS="SOUTH":GOTO 1050
1020 IF T<1 THEN 1030
1025 FOR XC=-1 TO 1:FOR YC=0 TO 7:NR(XC+
  1,YC)=PEEK(MAP+(MY-YC)*40+MX+XC):NEXT YC
  :NEXT XC:AS="NORTH":GOTO 1050
1030 IF S<1 THEN 1040
1035 FOR XC=-1 TO 1:FOR YC=0 TO 7:NR(XC+
  1,YC)=PEEK(MAP+(MY-XC)*40+MX-YC):NEXT YC
  :NEXT XC:AS="WEST":GOTO 1050
1040 IF S<1 THEN 1050
1045 FOR XC=-1 TO 1:FOR YC=0 TO 7:NR(XC+
  1,YC)=PEEK(MAP+(MY+XC)*40+MX+YC):NEXT YC
  :NEXT XC:AS="EAST"
1050 GOSUB 680:POKE 77,0
1060 IF STRIG(0) OR MAPSW=0 THEN 1065
1061 IF P3>2 THEN SOUND 0,50,12,6:PRINT
  "4+THREE LOOKS IS YOUR LIMIT":FOR I=1 TO
  0:100:NEXT I:GOTO 1065
1062 GOSUB 4000:P3=P3+1:SETCOLOR 1,0,14:
  PRINT "4+CHECK MOTORCYCLE MAZE MAP #":P3
  :GOSUB 3000
1063 FOR X=1 TO 10:FOR P=1 TO 4:FOR I=1
  TO 10:NEXT I:COLOR P:PLOT MX,MY:NEXT P:N
  EXT X:SOUND 0,0,0,0:GOTO 1000

```

```

1065 SOUND 0,0,0,0:P=STICK(0):IF P=15 OR
  P=5 OR P=6 OR P=9 OR P=10 THEN 1060
1070 IF P=14 THEN MX=MX+S:MY=MY+T:SOUND
  0,120,6,SND4:IF NOT PEEK(MAP+MY*40+MX)
  THEN MX=MX-S:MY=MY-T:P=0
1080 IF P=13 THEN MX=MX-S:MY=MY-T:SOUND
  0,120,6,SND4:IF NOT PEEK(MAP+MY*40+MX)
  THEN MX=MX+S:MY=MY+T:P=0
1090 IF P=7 OR P=11 THEN P1=S:S=-T:T=P1
1100 IF P=11 THEN S=-S:T=-T
1110 IF P=0 THEN PRINT "4+CRASH!!":FOR
  P=15 TO 0 STEP -1:SOUND 0,120,12,P:FOR
  I=1 TO 5:NEXT I:NEXT P:P=0:MS=0
1120 I=MAP+MY*40+MX:IF PEEK(I)=2 THEN 20
  00
1130 POKE 1,3:IF P THEN 1000
1140 GOTO 1060
2000 PRINT "4+ *** YOU ARE FREE ***":
  FOR X=1 TO 5:FOR Y=200 TO 0 STEP -4
  2010 SOUND 2,Y,10,X*3:NEXT Y:FOR I=1 TO
  4:PLOT RND(0)*159,0:DRAWTO RND(0)*159,79
  :NEXT I:X:SOUND 2,2,2
  2020 FOR I=1 TO 100:NEXT I:GOSUB 4000:PR
  INT "4+ *** YOU'RE FINAL MAP ***":GOSUB
  3000:POKE 752,0:END
3000 MAP=ADR(MAP$):FOR Y=3 TO LENGTH-2:F
  OR X=3 TO WIDTH-2:COLOR PEEK(MAP+Y*40+X)

3010 SOUND 0,290-Y*14-X,10,6:PLOT X,Y:NE
  XT X:NEXT Y:RETURN
4000 GRAPHICS 3:COLOR 1:PLOT 1,1:DRAWTO
  WIDTH,1:DRAWTO WIDTH,LENGTH:DRAWTO 1,LE
  NTH:DRAWTO 1,1:POKE 752,1:RETURN
5000 GRAPHICS 2:SETCOLOR 1,0,14:PRINT #6
  " / motorcycle \":PRINT #6:" / maze
  rider \":PRINT #6:OPEN #1,4,0,"K:"
5002 WIDTH=39:LENGTH=19:DP=96:D2=DP*8
5003 DIM MAP$(800),A$(5),C$(1),NR(2,7)
5010 PRINT #6:PRINT #6:PRINT #6:" 4+ANAL
  OG 400/800 \":PRINT #6," 4+magazine 3
  4+4+PRINT #6
5040 PRINT "4+ DO YOU WANT TO LEAVE A
  TRAIL":GET #1,A:IF CHR$(A)="Y" THEN FEE
  T=1
5050 PRINT "4+ DO YOU WANT EXTRA PASSA
  GES":GET #1,A:IF CHR$(A)="Y" THEN EXTRA
  =1:GOTO 5060
5060 PRINT "4+ DO YOU WANT TO USE THE
  MAP":GET #1,A:IF CHR$(A)="Y" THEN MAPSW
  =1:GOTO 5070
5070 PRINT "4+ DO YOU WANT MOTORCYCLE
  SOUND":GET #1,A:IF CHR$(A)="Y" THEN SND
  =1
5080 RETURN
6000 DATA 0,28,46,60,68,74,78

```

GRAPHICALLY SPEAKING....

Russ Wolter

PIXELS

Most microcomputers (such as Radio Shack, Apple, and Atari) use a television screen instead of paper; and the screen is divided into thousands of little rectangles, called **pixels**. The pixel in the upper-left corner of the screen is called pixel 0,0; just to the right of it is pixel 1,0; then comes pixel 2,0; etc. Underneath pixel 0,0 is pixel 0,1. Here are the positions of the pixels:

pixel 0,0	1,0	2,0	3,0	4,0	5,0, etc.
pixel 0,1	1,1	2,1	3,1	4,1	5,1, etc.
pixel 0,2	1,2	2,2	3,2	4,2	5,2, etc.
pixel 0,3	1,3	2,3	3,3	4,3	5,3, etc.

Each pixel's name consists of two numbers. The first number is called the **X coordinate**; the second number is called the **Y coordinate**. For example, if you're talking about pixel 5,3, its X coordinate is 5, and its Y coordinate is 3. The X coordinate tells how far to the right the pixel is; the Y coordinate tells how far down; so the pixel 5,3 is the pixel that's 5 to the right and three down.

So on the computer, the Y coordinate measures how far down. If you had the misfortune to read an old-fashioned math textbook (in which the Y coordinate measured how far up), you'll have to reverse your thinking!

How many pixels are on the screen? If you're using high resolution, the screen contains many pixels; each pixel is tiny. If you're using low resolution, the screen contains few pixels; each pixel is huge. You can choose either low resolution or high resolution. Here's how on the Atari...

ATARI

To produce colors, Atari's computer uses sixteen hues, which are numbered from 0 to 15. Hue 0 is gray; 1 is gold (orangish yellow); 4 is red; 8 is blue; 12 is green; and 15 is russet (reddish brown). The other numbers are hues that are in-between; for example, 2 is orange, 6 is purple, and 10 is turquoise.

The computer also uses eight luminances, which are numbered 0, 2, 4, 6, 8, 10, 12, and 14. Luminance 0 is "very dark"; 14 is "very light"; the other numbers are in-between. For example, since "pink" is the same as "light red", you can produce pink by choosing hue 4 ("red") and luminance 12 ("light"). Since "brown" is the same as "dark gold", you can produce brown by choosing hue 1 ("gold") and luminance 2 ("dark"). Since "black" is the same as "very dark gray", you can produce black by choosing hue 0 ("gray") and luminance 0 ("very dark").

You have five major paint buckets, numbered from 0 to 4. Usually, the buckets

contain these paints...

Bucket 0 contains medium orange (hue 2, luminance 8).

Bucket 1 contains light green (hue 12, luminance 10).

Bucket 2 contains dark greenish-blue (hue 9, luminance 4).

Bucket 3 contains medium red (hue 4, luminance 6).

Bucket 4 contains black (hue 0, luminance 0).

But you can change what's in the buckets. For example, to change bucket 2 to pink (hue 4, luminance 12), put this command into your program:

```
50 SETCOLOR 2,4,12
```

It means: set the color of bucket 2 to hue 4 and luminance 12. If you give that command, everything you paint by using bucket 2 will be pink. Moreover, the command works retroactively: everything that you had already painted by using bucket 2 changes its color (from dark greenish-blue) to pink. For example, if you had painted a picture of a dark greenish-blue fish (by using bucket 2), and then you say SETCOLOR 2,4,12, the entire fish suddenly changes its color from dark greenish-blue to pink.

Besides those five major paint buckets, you also have an "auxiliary" paint bucket. It automatically contains the same luminance as bucket 1, and the same hue as bucket 2. For example, if bucket 1 contains light green (whose luminance is 10), and bucket 2 contains dark greenish-blue (whose hue is 9), then the auxiliary bucket contains the color whose luminance is 10 and whose hue is 9: that color is light greenish-blue.

You can use 32 graphics modes, which are numbered from 0 to 31. Your program's top line must say which graphics mode to use. For example, if you wish to use graphics mode 19, your program's top line must say:

```
10 GRAPHICS 19
```

The next few lines should say SETCOLOR, if you wish to change the colors that are in the buckets.

Here's how to use the most popular graphics modes...

Mode 19. In this mode, the X coordinate must be from 0 to 39, and the Y coordinate must be from 0 to 23. Initially, the entire screen has been painted by bucket 4; but you can change the color of each pixel, by using four paintbrushes:

Brush 0 has been dipped in bucket 4.

Brush 1 has been dipped in bucket 0.

Brush 2 has been dipped in bucket 1.

Brush 3 has been dipped in bucket 2.

Example:

```
Use graphics mode 19 — 10 GRAPHICS 19
```

```
Using brush 2, paint pixel 27,13 and pixel 25,19 — 20 COLOR 2: PLOT 27,13: PLOT 25,19
```

```
Using brush 1, draw a line from 20,17 to 13,15 — 30 COLOR 1: PLOT 20,17: DRAWTO 13,15
```

Pause, to let the human admire the picture — 40 GO TO 40

To abort that program, and to stop using graphics mode 19, press the SYSTEM RESET button.

Mode 20. This resembles mode 19, but lacks brushes 2 and 3, and therefore consumes less memory.

Mode 21. This resembles mode 19. But the X coordinate can go from 0 to 79, and the Y coordinate can go from 0 to 47.

Mode 22. This resembles mode 21, but lacks brushes 2 and 3, and therefore consumes less memory.

Mode 23. This resembles mode 19. But the X coordinate can go from 0 to 79, and the Y coordinate can go from 0 to 95.

Mode 24. To use this mode, you must buy at least 16K of RAM memory. In this mode, the X coordinate can go from 0 to 319; the Y coordinate can go from 0 to 191. Initially, the entire screen has been painted by bucket 2; but you can change the color of each pixel, by using two paintbrushes:

Brush 0 has been dipped in bucket 2.

Brush 1 has been dipped in the auxiliary bucket.

Because the pixels are so tiny, you might have trouble seeing them. To help yourself see them, make the luminance of bucket 1 very high, by giving this command:

20 SETCOLOR 1,0,14

Here's a complete program:

Use graphics mode 24 — 10 GRAPHICS 24

Use high luminance — 20 SETCOLOR 1,0,14

Using brush 1, paint pixels 140,17 and 142,19 — 30 COLOR 1: PLOT 140,17: PLOT 142,19

Using that brush, draw a line from 20,7 to 302, 146 — 40 PLOT 20,7: DRAWTO 302,146

Pause, to let the human admire the picture — 50 GO TO 50

To abort that program, and to stop using graphics mode 24, press the SYSTEM RESET button.

Mode 0. This is the "normal" mode: it's the mode you find yourself in, whenever you press SYSTEM RESET, and whenever you aren't thinking about graphics. In this mode, the X coordinate can be from 0 to 39, and the Y coordinate can be from 0 to 23. Initially, the entire screen is painted by bucket 2 — except for the screen's border, which is painted by bucket 4. This program prints the word JAR, so that the J is at pixel 14,9, and so that the A is at the next pixel (15,9), and so that the R is at the next pixel (16,9):

Clear the screen — 10 GRAPHICS 0

Beginning at pixel 14,9, print JAR — 20 POSITION 14,9: PRINT "JAR";

Pause to let the human admire it — 30 GO TO 30

The word JAR is painted by the auxiliary bucket.

Mode 17. In this mode, the X coordinate must be from 0 to 19, and the Y coordinate must be from 0 to 23. Initially, the entire screen has been painted by bucket 4. This program prints the word JAR, so that the J is at pixel 14,9, and so that the A is at the next

pixel (15,9), and so that the R is at the next pixel (16,9):

Use graphics mode 17 — 10 GRAPHICS 17

Beginning at pixel 14,9, print JAR — 20 POSITION 14,9: PRINT#6; "JAR";

Pause, to let the human admire it — 30 GO TO 30

The word JAR is painted by bucket 0. If you try to print a small (lower-case) letter (by pressing the LOWER key), the computer will print it capitalized instead, and will paint it by using bucket 1. If you try to print a dark-on-light capital letter (by pressing the **A** key), the computer will print it light-on-dark instead, and will paint it by using bucket 2. If you try to print a dark-on-light small letter (by pressing the **a** and LOWER keys), the computer will print it as a light-on-dark capital instead, and will paint it by using bucket 3.

Mode 18. This resembles mode 17. But the Y coordinate must go from 0 to 11.

Split-screen modes. You can make the bottom part of the screen be in mode 0, and the top part of the screen be in a different mode. Here's how:

GRAPHICS 1 — The screen's bottom is in mode 0; the screen's top is in mode 17.

GRAPHICS 2 — The screen's bottom is in mode 0; the screen's top is in mode 18.

GRAPHICS 3 — The screen's bottom is in mode 0; the screen's top is in mode 19.

ETC.

GRAPHICS 8 — The screen's bottom is in mode 0; the screen's top is in mode 24.

In those split-screen modes, the bottom sixth of the screen is in mode 0; the top five-sixths are in a mode from 17 to 24. The bottom sixth, which is in mode 0, contains just 4 lines of text. To create that text, you can say PRINT, but you can't say POSITION: in split-screen mode, the bottom sixth doesn't understand POSITION. The top five-sixths, which are in a mode from 17 to 24, have fewer Y coordinates than if the whole screen were devoted to that mode: a sixth of the Y coordinates are missing.



Dysan

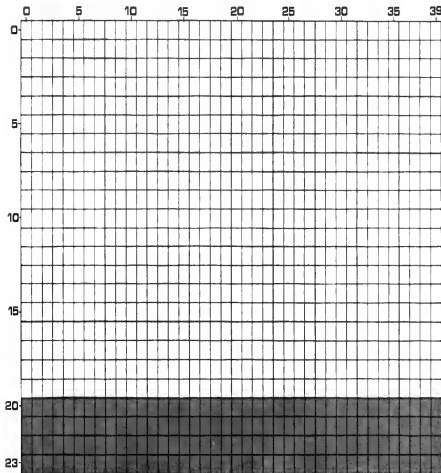
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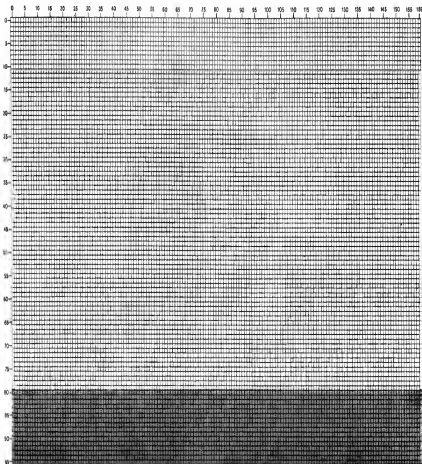
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Graphics Mode 3 (4 COLORS-273 BYTES)& Mode 0 (1 COLOR-993 BYTES) (2 LUMINANCE-TEXT)



NOTE: Graphics Mode 0 is a text mode full-screen display only.

Graphics Mode 6(2 COLORS-2025 BYTES) & Mode 7(4 COLORS-3945 BYTES)



SOFTWARE PROFILE — ATARI STOCK & BOND ANALYSIS

By Peter Pappas

With the recent developments in the computer field, it was only a matter of time before they would become available to the small businessman. ATARI has created a line of programs for their 800 computer system, which more than meet the needs of a businessman who could use a more organized system of investment analysis. ATARI's Investment Analysis Series of programs can be used by the small businessman or firm, to provide them with a personal analysis of current investments and to assist the individual in determining which investments to make in the future. The Bond Analysis and Stock Analysis programs are two facets of this program series.

The Bond Analysis program will allow the business minded investor to "study and calculate bond investments." The program provides the individual with a graphic listing of his investments including their net return or loss and cash value, annual coupon in dollars, the redemption value, maturity and yield, and tax yields utilizing normal income and capital gains rates. These programs base their information on the actual bond information which you provide. While the Bond Analysis program provides you with an analysis or projected pattern for bonds, the Stock program performs roughly the same task for your stock portfolio. This program will provide you with a portfolio analysis using statistical measures of return, deviations between stocks, rates of returns of stocks over a given period of time and a projected analysis of your stock's intrinsic value and growth rate. Both of these programs take your information and project it over a period of time, thus providing you with a chance to alter your investment picture before it becomes too late. Aspects of the actual economy do not affect the computer's analysis of either your bond or stock portfolio. Therefore, the careful investor should only use these aids in investment analysis as a part of a total investment analysis package. These programs are not intended to offer the investor advice; their only intention is to provide the investor with an accurate calculation of (a) his net return or loss, cash value, price and accrued interest and the before and after tax yield of a given bond, (b) the arithmetic mean and standard deviation, annual rates of return and the intrinsic value of your stocks. All of the computer's information is based on the investor's stocks and bonds. Extraneous material is not taken into account in this program.

As a final note, it is important that the investor understand exactly the data which these two programs provide. Utilizing the ATARI 800 computer, these programs provide an analysis of either a stock or bond. They do not project the future for your portfolio. They can not tell you whether your stock will split or fall. All these programs do is

provide the user with a means through which he can compare different portfolios in a simple and accurate format which will also provide him with certain consequential calculations. Therefore, if you're in need of a means with which you can organize, analyze, and compute certain information for investment and tax purposes, then the ATARI Investment analysis program series should fit all your investment analysis needs. □

SOFTWARE REVIEW — ATARI MAILING LIST

ATARI's Mailing List program is a fine home-based address keeper and sorter. It is cassette based saving and loading 'files' to and from the 410 recorder. However, by deleting two lines in the program, the built in disk file routines are made available to the user, allowing the names and addresses to now be stored and retrieved on the 810/815. There are 9 lines per file to be filled in for name, address, zip code, telephone, and one last line for any extra note or message you may want to add.

The nicest feature on Mailing List is the ability to sort the files from any field you choose. A field can be last names, middle initials, area codes, or any of the nine lines of data you supplied the computer. For example, if the zip code field is chosen for sorting, the program will run through its memory selecting those names/addresses with the same zip as the one you input; or you can tell the computer to list all those names with zip codes greater than the one you input, less than, or all zips but the one you picked. This will take longer to do as the files it must search through increase in number. Besides numerical sorting, the computer can sort alphabetically. Suppose you need all the names starting with the letter 'A'. Type in 'Last Name' for the field, then the letter 'A'. Then, when prompted by the computer, 'LT' (for less than) and the program will search through memory selecting only those names with the 'A' for the first character.

Another variation on the program cassette's other side allows you to set up your own 'field' labels. Instead as Name, you can call it 'Part Number'. Replace 'Street' with 'Item', etc., and you can use this Mailing List program as a small inventory file!

Two methods of hardcopy printing are included, these being mailing label format and a listing of all the data in a certain file. Mailing label format will print everything but the telephone number and your extra added note. You can also select what to print — either all or just some of the files in memory. For a home mailing list application this program will fill the needs more than adequately (available on cassette for \$19.95 list, requires 24K RAM + 410 Recorder). □

BUGS & BYTES....

by Mike DesChenes

As far as price, flexibility, performance, and hardware are concerned, I consider the Atari computers to be the best on the market. And because A.N.A.L.O.G. is concerned only with the Atari computers, this column will be short lived. However, if you have any problems or questions no matter how minute they may seem to you, drop me a line and I'll try and include it along with the remedy in this column.

Occasionally a number of early Atari's have given their owners quite a scare because of a very minor problem.

SYMPTOM: You turn your system on and out of the clear BLUE sky...nothing! (Well, almost nothing). Just a dark blue screen (depending on your monitor). You bang it a little, turn it off and on a few times, and finally it surrenders with "READY". Other than a complete meltdown, I can't think of anything more frightening.

CAUSE: If you were to look inside the 400; I wouldn't recommend it if your warranty is still in effect or if you're not mechanically inclined; or take the door off the 800, you would notice the ROM and RAM boards. In the 400 you would see two vertically mounted PC boards, which are the RAM and CPU boards (The 800's CPU board is mounted internally in the area directly behind the third RAM board slot.) Actually the 400 and 800 both use the same type of RAM board. Contained in the 800's 8K RAM cartridge is the same board that you would find in an 8K 400 (give you any ideas?) The problem stems from the edge connectors on either or all of the boards. Oxidation because of humidity or other environmental conditions, may cause a bad connection between the boards and sockets.

CURE: When taken to one of the Control Data repair centers, they remedy this problem by simply removing the boards from their pin connectors and gently cleaning the surfaces of the board pin contacts and lightly coating them with "Lubiplate" (available at many industrial electronic part suppliers.)

If you have previously had your Atari upgraded or serviced at any one of the Control Data repair centers, then it would be safe to assume that the above specifications have already been performed. Which proves to me that Atari and Control Data are working closely together to maintain the high standards of excellence that Atari owners have come to expect.

NOTE: I have noticed that most of the newer 800's have been shipped with gold plated edge connectors on the RAM and ROM boards, and according to an Atari official, the 400's will be coming through the same way.

HAPPY BIRTHDAY

How old is your Atari? Three months? I don't mean how long have you been the proud owner, but how many days, weeks, months, have gone by since it was built? Who cares? Well, it may not be as important to you as the new Asteroids cartridge, but admit it, you must be a little curious.

The 800 which I constantly use has the serial number 490. Some of the later ones also have the first three numbers with W/W preceding them (Example W/W490). These first three numbers tell the year and work week that your computer was built. The first two numbers designate the work week, in this case the 49th. The third number (0) tells you the year (0 = 1980, 9 = 1979 and so on.) You can also read your serial number in the same way on the Atari disk drives. I'll bet that the next few minutes you'll be taking a peek at your serial number. □



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EDITING LOCK UP?

Have you ever spent hours working on a program, editing and deleting lines or words only to be rewarded by having your ATARI lock up on you? With no alternative left but to turn the power off and start over? If the answer to that question is yes, then you're not alone. Don't worry, there is nothing wrong with your system (well nothing that can be repaired anyway.) It seems that if you spend a lot of time editing any part of a program, you will find that more often than not, it will lock up. For some strange reason your ATARI can not perform too many edits at a time. One way to avoid this dilemma is to LIST or RUN the program after every couple of line edits. If you follow this simple practice you may find that your problem will be solved. This may seem like an inconvenience but if you weigh this against the possible loss of a valuable program, and the great editing capabilities of the ATARI, then it seems a small price to pay.

Have you ever wished that it was possible to ask your Atari how it was feeling? Well, below is a listing which can help give you an idea of your Atari's health.

It's actually a very simple program which utilizes the fill function. The program fills the screen with a color (1) and should fill all pixels. If there is a pixel which did not retain the color, then there is a good chance that there is a bad bit. However, a bad bit may never be noticed and it does not necessarily mean that you'll have any problems. But it's a comforting feeling knowing that everything is up to par.

```
10 GRAPHICS 7+16
20 PLOT 159,95
30 DRAWTO 159,0
40 DRAWTO 0,0
50 POSITION 0,95
60 POKE 765,1
70 XIO 18,#6,0,0,"S:"
80 GOTO 80
```

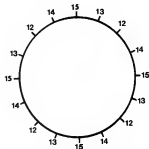


Figure 10-4

STICK

(Driving Controllers)

Format: STICK(aexp)

Example: PRINT STICK(0)

This function works the same way as the paddle and STICK commands, but in this case is being used with the Atari Driving Controllers. The driving controllers are numbered from 0-3 from left to right.

Figure 10-4 shows the numbers that will be returned when the driving controller is turned in any direction.

NOTE: You may find it helpful if the above information is photocopied and attached to page 60 of your Basic Reference Manual.

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By Jerry White



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ANGLE WORMS/ CROTON DIVERISON

By Stan Ockers



8K
BASIC



ANGLE WORMS - For 2 players (Requires two joysticks, if NONE is entered for second player's name then one may play). Each player attempts to prevent his growing worm from hitting an obstacle! Each worm may fire a projectile from its head to try and shorten its own length. Watch for the walls!

ATARI 400/800 Tape to Disk 051-0092 \$ 9.95



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TALK TO ANALOG THROUGH COMPUERVE:

Messages may be left through EMAIL, if you have any questions or need information on ANALOG or the ATARI Computers, contact Lee Pappas (User ID #70465,551) or Mike DesChenes (#70735,445). Answers will be left through EMAIL. Also on COMPUERVE is "DISCOVERY" Magazine. Tandy Trower at ATARI has a 30-40 page monthly "magazine" for ATARI owners containing info from ATARI and programming hints. Through this you can also leave messages to ATARI.

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In the Spotlight

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This section will keep you up to date on those companies producing good products at service we feel is better than average. To qualify, the software or hardware must be bugfree (no problems or defects), and the company behind it not a 'fly by night operation'. The latter may be difficult to identify, many times a problem such as this isn't detectable ahead of time. One producer of 16K memory boards, 'Just Another Computer Company' (JACC), disappeared without notice (or a trace).

What I have seen from "Quality Software" thus far is a group of programs well written and error free. What I thought was nice of them involved the 'Tari-Trek' Star Trek game. After completion and initial release of the game, QS had a number of requests for a galactic map, the version in release now includes this feature. 'Tank Trap' at first glance looks simple and non-exciting, however after one or two games, see if YOU can turn the game off! Assembly subroutines are used to move the tank on the screen. (Reviews of both these games can be found in this issue).

The version of backgammon they produce uses graphics mode zero. When Bob Christiansen wrote the game 'Fastgammon', he wanted it to run on the 400 and 800. This meant it had to fit in 512K or less, however the graphic characters are used to making up the board. This game is written in QS's own Assembler language, which they market also. Their assembler is great to add routines in BASIC programs, making things run faster and smoother. Also marketed is a disassembler. And soon to be released, 'QS Forth', a new language to micro-computers, and a fairly complex one. You can define your own 'labels' for commands and the QS version allows for the use of up to four disk drives. Price of this is \$79.95 on diskette.

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PERSONAL SOFTWARE

SOFTWARE REVIEW — VISICALC

You have more than likely heard of VISICALC (if not, then where have you been?), the "wonderful, amazing program". Well the only way you can find out for certain is to try it out. There have been so many reviews of VISICALC, I won't go into it too much. I CAN tell you that this program has been invaluable to ANALOG assisting us to determine just how many copies of the first issue we should print. The program can do many things besides: sales projections, personal financing and check balancing, taxes, and much more.

Learning to use VISICALC may seem like taking on a new programming language, it is very extensive — plan on spending some time with it. The 'screen' consists of a matrix with hundreds of locations you can access at any time, where you can place numbers or labels. When you need a calculation, it takes place very fast, and by changing one variable, the results of an entire problem can change with it, saving quite a bit of time.

To run this you will need 32K (although Personal Software recommends 48K), a disk drive, and several blank diskettes to save work you have done. The package consists of the VISICALC disk, a workbook from which you learn how to use VISICALC, and a small reference card with a summary of the commands.

This is a handy program to have at home, and I feel an invaluable one for business. While you can get by without it, I suppose you can get by without a television or calculator, too. □

ATARI Color Rainbow

Displays all 128 colors on your screen! 16 colors with 8 hues each.

Note: hit 'SYSTEM RESET' to stop

```
5 SETCOLOR 2,0,8:POKE 752,1:PRINT CHR$(125)
10 DIM C$(24)
20 FOR I=1 TO 24
30 READ D
40 C$(I,1)=CHR$(D)
50 NEXT I
60 D=USR(FOR(C$))
70 END
100 DATA 162,8,173,11,212,281,32,286,243,141
110 DATA 18,212,142,24,288,232,232,286,246,142
120 DATA 24,286,248,232
```


SUB

By Lee Pappas

You are the commander of a sub patrolling enemy waters. Your mission is to rid this area of deadly mines and make these waters safe for travel. Use joystick #1 to move your sub in the direction you choose. The fire button will launch a torpedo with a limited range. You have no limits on time or number of times you can fire.

The "POKE 20,0" sets the clock in the ATARI to coordinate the movements of the gunboat, torpedo, and depthcharge, at certain points the clock is reset, "PEEK". The "CT=" checks to see what number the clock is up to in its counting. The movement of the sub is straightforward using standard BASIC commands with the joystick functions.

```

10 REM *** "SUB" VERSION 1. 1980
11 REM YOUR GOAL IS TO DESTROY
12 REM GUNBOAT ON SURFACE AS
13 REM MANY TIMES AS YOU CAN
14 REM DO THIS BY EXPLODING A
15 REM W MINE A "LASER" WILL GO
16 REM TOWARDS SURFACE AND HIT
17 REM GUNBOAT IF YOUR SUB HITS
18 REM W MINE YOU HAVE ONE LESS
19 REM CHANCE OF HITTING THE GUNBOAT
20 REM
30 GRAPHICS 23 SETCOLOR 0,0,0
50 H=50 U=0 L=32 SETCOLOR 4,7,0
70 COLOR 3 PLOT 159,30
80 DRAWTO 159,0 DRAWTO 0,0
90 POSITION 0,30 POKE 765,3
100 XID 10,0,0,0,"S "
110 REM *** PLOT MINES
120 COLOR 5 FOR N=1 TO 40
150 PLOT RND(0)*159,RND(0)*62+32
160 NEXT N
170 REM *** PLOT SHIP
180 SI=RND(0)*150 S2=S1+6
190 PLOT SI,30 DRAWTO S2,30 PLOT SI+2,29
    PLOT SI+3,29
200 REM *** PLOT SUB
210 COLOR 6 PLOT H,U
220 DRAWTO H+4,U PLOT H+3,U-1
230 REM *** PLOT CLOUDS
240 FOR C=1 TO 5 X=RND(0)*157
250 Y=RND(0)*65 Y1=Y+1 PLOT X,Y
260 DRAWTO RND(0)*60,RND(0)*60 Y1=Y+1 DRAWTO
    X+1,Y1 DRAWTO X+1,Y+2
270 NEXT C
300 REM *** MAIN ROUTINE
310 POKE 20,0
320 CT=PEEK(20)
330 IF CT THEN GOSUB 620
340 IF CT>10 THEN SOUND 1,0,0,0
350 S=STICK(0) IF STRIG(0)>0 THEN 440
370 TOR=H+5
380 COLOR 3 PLOT TOR,U COSUB 620
390 IF H+20<TOR THEN 430
400 COLOR 0 PLOT TOR,U LOCATE TOR+1,U,2
    TOR+TOR+1 IF TOR>150 THEN 430
410 IF Z<1 THEN 380
420 SOUND 1,100,0,14 COLOR 6 PLOT TOR,U
    DRAWTO TOR,31 RI=RI+1
430 TP=TP+1 COLOR 0 PLOT TOR,U IF Z=1 TH
    EN DRAWTO TOR,31
435 IF Z<1 OR TOR<SI OR TOR>S2 THEN 440

```

```

436 COLOR 6 FOR I=1 TO 10 PLOT TOR,30 OR
    440 TOR=RND(0)*7-3,RND(0)*7+23 NEXT I
437 COLOR 3 FOR I=30 TO 23 STEP -1 PLOT
    0,I DRAWTO 159,I NEXT I
438 SOUND 0,0,0,0 SOUND 1,0,0,0 FOR I=1
    TO 1000 NEXT I S=S+1
440 IF S=15 THEN 500
445 IF (S<13 AND S<9 AND S<5) OR U>91
    THEN 480
450 COLOR 0 PLOT H+3,U-1 PLOT H,U DRAWTO
    H+4,U U=U+1
460 COLOR 6 PLOT H,U DRAWTO H+4,U
470 PLOT H+3,U-1
480 IF (S<7 AND S<6 AND S<5) OR N>149
    THEN 520
500 COLOR 0 PLOT H,U PLOT H+3,U-1 COLOR
    6 PLOT H+5,U
510 PLOT H+4,U-1 H=H+1
520 IF (S<11 AND S<9 AND S<10) OR H<2
    THEN 550
530 COLOR 6 PLOT H+1,U PLOT H+2,U-1 COLO
    R 0 PLOT H+4,U PLOT H+3,U-1 H=H+1
550 IF (S<14 AND S<10 AND S<6) OR U<3
    THEN 590
560 COLOR 0 PLOT H,U DRAWTO H+4,U U=U+1
570 COLOR 6 PLOT H,U DRAWTO H+4,U PLOT H
    +3,U-1
590 IF Y=1 THEN GOSUB 730
600 GOTO 320
620 REM *** MOVE SHIP
640 COLOR 5 PLOT SI-1,30 DRAWTO S2-1,30
    PLOT SI+1,29 PLOT SI+2,29
650 COLOR 3 PLOT S2,30 PLOT SI+3,29
660 IF OT>30 THEN OT=0 D=52 GOTO 730
670 SI=SI+1 S2=S2-1
680 IF SI<1 THEN COLOR 3 PLOT 0,30 DRAWTO
    15,30 DRAWTO 0,29 COLOR 5 SI=153 S2=15
    9
700 REM *** DEPTH CHARGE TIMER
710 SOUND 0,50,4,6 IF CT>20 THEN OT=OT+1
    POP GOTO 310
720 RETURN
730 LOCATE 0,L+1,M IF M=2 THEN 850
750 IF M<1 THEN 700
760 COLOR 0 PLOT 0,L-1 SOUND 2,100,0,14
    PLOT 0,L+1 FOR T=1 TO 100 NEXT T
770 SOUND 2,0,0,0 L=32 Y=0 RETURN
780 COLOR 5 PLOT 0,L COLOR 0 PLOT 0,L-1
    Y=1
810 IF L>91 THEN Y=0 PLOT 0,L L=32 RETURN
    M
820 L=L+1 RETURN
850 SOUND 1,10,0,14 SOUND 2,50,0,14 SOUN
    D 3,100,0,14 COLOR 1 PLOT H,U DRAWTO H+4
    ,U
860 COLOR 6 PLOT H,U PLOT H+2,U PLOT H+4
    ,U FOR T=1 TO 100 NEXT T PLOT H+1,U PLOT
    H,U-1
870 PLOT H+1,U-1 PLOT H+3,U-2 PLOT H+4,U
    PLOT H+5,U-1 PLOT H+5,U-1 FOR T=1 TO 10
    0 NEXT T
880 GRAPHICS 0 PRINT "END OF ENCOUNTER
    " PRINT
890 PRINT "NUMBER OF SHIPS HIT " ,SH
905 PRINT "NUMBER OF MINES HIT " ,MI
940 PRINT "NUMBER OF TORPEDOS " ,TP
999 END

```

LUNAR LANDER

Prodata Group

P.O. Box 2464

Fullerton, CA 92634

\$11.75 — 16K Cassette

I have always been a sucker for space and science fiction related games, and Prodata Group's Lunar Lander is no exception. Anyone who has visited an arcade will no doubt be familiar with this program. One of the things which I felt was lacking in this version is the use of a star field, which if added would give the game more realism. The addition of a star field should be an easy task for any knowledgeable programmer.

Once the program is loaded, the next thing to do would be to type in "RUN" and then hit "RETURN". Fine, however I had the feeling that I was being rushed. As soon as you hit "RETURN", the Lunar terrain is plotted and the ship is already starting along its descent. I would like to have seen the use of a title along with a couple of skill level options listed at the beginning of the game.

The ship always starts its descent at position 10,10 (graphics mode 7.) The object is to maneuver your ship to an ideal location on the lunar surface, and make a soft landing before exhausting your fuel supply. I have found it next to impossible to reach the surface with the amount of fuel allocated in this program, so I have therefore changed the program to give myself 200 units of fuel instead of the usual 50. This now gives me a chance to complete a game without destroying my ship. The joystick control is used for thrust and ship direction. Moving the stick up adds thrust, and down naturally lessens the amount of thrust. Moving the stick to either the right or left controls the horizontal thrust and horizontal direction. One feature which I found to be very appealing was the addition of information in the text window which keeps you updated on the thrust (0-11), vertical velocity, horizontal velocity, and amount of fuel.

In the arcade version, when your ship is close to the lunar surface, the screen automatically changes to give the viewer a close up of the terrain where the ship will try to land. In this program, you must wait until your ship reaches an area that is below two yellow lines located just above the surface. Once your ship is below these lines, you must push the joystick button which will then change the screen to the close up view of the surface. If you happen to misjudge your position and press the button too soon or too late, you may find yourself crashing into the lunar surface. Speaking of crashing, if you find yourself in this unfortunate position, there is a very realistic crashing sound along with the word CRASH printed at the bottom of the screen (a nice feature if you're playing late at night and don't have the sound on.) If you are lucky enough to land your ship safely,

you will be rewarded with a CONGRATULATIONS. This is an enjoyable program which should be fun for the whole family. The only thing that I felt should have been added were the star field and skill levels that would give the player a greater amount of fuel. All in all, good clean fun. □

"PRETTY" Graphics Demo

Note: after completion, hit any key to clear

```
10 DEG
20 GRAPHICS 24
30 COLOR 1
40 SETCOLOR 2,0,0
50 FOR I=1 TO 360 STEP 5
60 X=219+I/360
70 Y=80+80*SIN(I)
80 IF I>270 THEN 180
90 PLOT 8,8
100 DRAWTO X,Y
110 IF I/90 THEN 130
120 DRAWTO 319,159
130 NEXT I
140 IF PEEK(764)<1255 THEN END
150 GOTO 140
```

SWIRL — AN ANIMATED GRAPHICS DEMO

```
10 C=0:Q=1:SETCOLOR 1,5,5:DEG
20 X1=80:Y1=50:GRAPHICS 23
30 PLOT X1,Y1
40 FOR I=1 TO 1800 STEP 5
50 Q=Q+1:IF Q/3.5 THEN Q=1
60 COLOR Q/8+1/18+I
70 X=X+COS(T)*V*W*SIN(I)
80 IF V*W/10 THEN 140
90 PLOT X,X1,Y,Y1
100 X=(1+C)/16+COS(1+C*90)
110 Y=(1+C)/16+SIN(1+C*90)
120 DRAWTO X,X1,Y,Y1
130 NEXT I
140 SETCOLOR 2,8,2:SETCOLOR 1,8,5
150 SETCOLOR 8,8,8:GOSUB 210
160 SETCOLOR 8,8,2:SETCOLOR 2,8,5
170 SETCOLOR 1,8,8:GOSUB 210
180 SETCOLOR 1,8,2:SETCOLOR 0,8,5
190 SETCOLOR 2,8,8:GOSUB 210
200 GOTO 140
210 FOR K=1 TO 13:NEXT K:RETURN
```

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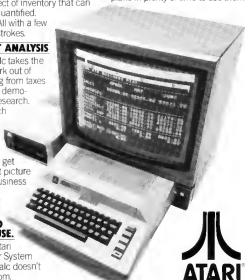
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